WORKING PAPER 46

# Effects of Trade Liberalization on Agriculture in Malaysia: Commodity Aspects

Tengku Mohd Ariff Tengku Ahmad
and Ariffin Tawang

The CGPRT Centre
Working Paper Series, September 1999

## The CGPRT Centre

The Regional Co-ordination Centre for Research and Development of Coarse Grains, Pulses, Roots and Tuber Crops in the Humid Tropics of Asia and the Pacific (CGPRT Centre) was established in 1981 as a subsidiary body of UN/ESCAP.

**Objectives**

In co-operation with ESCAP member countries, the Centre will initiate and promote research, training and dissemination of information on socio-economic and related aspects of CGPRT crops in Asia and the Pacific. In its activities, the Centre aims to serve the needs of institutions concerned with planning, research, extension and development in relation to CGPRT crop production, marketing and use.

**Programmes**

In pursuit of its objectives, the Centre has two interlinked programmes to be carried out in the spirit of technical cooperation among developing countries:

1. Research and development which entails the preparation and implementation of projects and studies covering production, utilization and trade of CGPRT crops in the countries of Asia and the South Pacific.
2. Human resource development and collection, processing and dissemination of relevant information for use by researchers, policy makers and extension workers.

## CGPRT Centre Working Papers currently available:

Working Paper No. 33 *Effects of Trade Liberalization on Agriculture in Pakistan: Institutional and Structural Aspects*
by Muhammad Ramzan Akhtar

Working Paper No. 34 *Effects of Trade Liberalization on Agriculture in Malaysia: Institutional and Structural Aspects*
by Tengku Mohd Ariff Tengku Ahmad

Working Paper No. 35 *Effects of Trade Liberalization on Agriculture in the Republic of Korea: Institutional and Structural Aspects*
by Myung-Hwan Sung

Working Paper No. 36 *Effects of Trade Liberalization on Agriculture in Japan: Institutional and Structural Aspects*
by Hiroaki Kobayashi

Working Paper No. 37 *Effects of Trade Liberalization on Agriculture in the Philippines: Institutional and Structural Aspects*
by Minda C. Mangabat

Working Paper No. 38 *Effects of Trade Liberalization on Agriculture in India: Institutional and Structural Aspects*
by Ramesh Chand

Working Paper No. 39 *Effects of Trade Liberalization on Agriculture in Thailand: Institutional and Structural Aspects*
by Kajonwan Itharattana

(Continued on inside back cover)

# Effects of Trade Liberalization on Agriculture in Malaysia: Commodity Aspects

WORKING PAPER 46

# Effects of Trade Liberalization on Agriculture in Malaysia: Commodity Aspects

**Tengku Mohd Ariff Tengku Ahmad**
**and Ariffin Tawang**

**CGPRT Centre**
Regional Co-ordination Centre for
Research and Development of Coarse Grains,
Pulses, Roots and Tuber Crops in the
Humid Tropics of Asia and the Pacific

# Table of Contents

# List of Tables

# List of Figures

# Glossary of Acronyms

| | |
|---|---|
| AFTA | ASEAN Free Trade Area |
| BERNAS | Beras National Sdn. Bhd |
| CEPT | Common Effective Preferential Tariffs |
| CPO | Crude palm oil |
| CPKO | Crude palm kernel oil |
| DRC | Domestic resource cost |
| ECR | Export credit financing |
| ECIG | Export Credit Insurance and Guarantee Scheme |
| EPO | Effective protection coefficient |
| FELDA | Federal Land Development Authority |
| FFBs | Fresh fruit bunches |
| GMP | Guaranteed minimum price |
| KADA | Kemubu Agricultural Development Authority |
| LPN | Lembaga Padi dan Beras Negara (National Paddy and Rice Board) |
| MADA | Muda Agricultural Development Authority |
| MARDI | Malaysian Agricultural Research and Development Institute |
| MFCV | Malaysian Flue-cured Virginia |
| MPOPC | Malaysian Palm Oil Promotion Council |
| MTC | Malaysian Tobacco Company |
| NAP | National Agricultural Policy |
| NPC | National protection coefficient |
| NTB | National Tobacco Board |
| PIA | Promotion of Investment Act |
| POPCA | Palm Oil Credit and Payment Agreement |
| PORIM | Palm Oil Research Institute of Malaysia |
| PORLA | Palm Oil Registration and Licensing Authority |
| PPO | Processed palm oil |
| SSL | Self-sufficiency level |
| WTO | World Trade Organisation |

# Foreword

Responding to the growing concern for the effects of trade liberalization on regional agriculture, the CGPRT Centre has implemented a three-year research project “Effects of Trade Liberalization on Agriculture in Selected Asian Countries with Special Focus on CGPRT Crops (TradeLib)” since March 1997, in collaboration with partners from ten countries: China, India, Indonesia, Japan, Malaysia, Pakistan, the Philippines, the Republic of Korea, Thailand and Viet Nam. In all these countries, important issues regarding trade liberalization were investigated with an identical research framework by national experts.

The investigation covers major crops which might receive either favorable or unfavorable effects of trade liberalization both in export and import. I believe that the project will provide broad and practical knowledge on various aspects of the effects of trade liberalization; moreover, the information will be useful for researchers and policy planners not only in participating countries but also in other countries in the region. I would like to note that, however, since this project was conceived and started before the current currency and economic crisis began in the middle of 1997, the analysis handles basically the period before the crisis with available current information.

I am pleased to publish **Effects of Trade Liberalization on Agriculture in Malaysia: Commodity Aspects** as a report of the second phase of the country study of India. A report of the first phase of the country study, which includes institutional and structural aspects on the same subject, has been published before. I certainly hope these reports will be fully utilized for the improvement of agricultural trade and the encouragement of regional agriculture.

I thank Dr. Tengku Mohd Ariff Tengku Ahmad and Dr. Ariffin Tawang of Malaysia for their intensive research and the Malaysian Agricultural Research and Development Institute for allowing them to work with us and for providing continuous support. I am very much obliged to Dr. Boonjit Titapiwatanakun for his devoted contributed to the project as the regional advisor. I would also like to express appreciation to the Government of Japan for funding the project.

Haruo Inagaki
Director
CGPRT Centre

# Acknowledgements

This study on the effects of trade liberalization on Malaysian agriculture is sponsored by the UN-ESCAP CGPRT Centre. It is part of a larger study to assess the effects and implications of agricultural trade liberalization in the Asia – Pacific Region. In this respect we are especially very grateful to Dr. Haruo Inagaki, Director, CGPRT Centre for his support to this study and also for providing the opportunity for us to be involved in this study. His interest, dedication and leadership during the course of the study are highly appreciated.

We would also like to express our gratitude to the Director General of the Malaysian Agricultural Research and Development Institute (MARDI), Dato' Dr. Md. Sharif Ahmad and the Director of Economics and Technology Management Research Centre (ETM), MARDI, Mr. Samion Haji Abdullah for allowing us to be involved in the study. Their constant support and understanding have facilitated the conduct of this study.

We are particularly grateful to two individuals, who have been instrumental in shaping this study. Dr. Boonjit Titapiwatanakun, the Project Regional Advisor and Lecturer at the Faculty of Economics and Business Administration, Kasetsart University, Bangkok not only provided the necessary framework for the study but also advice and guidance throughout the course of this study. Specific constructive comments by Dr. Michio Kanai, the Project Leader, also have been very helpful. Both of them have played a major role in going through the initial drafts of this report and have tremendously contributed in improving the contents and presentation of this report. To both of them we would like to express our utmost gratitude. We also benefited from the various comments and suggestions from other team members during the presentations of the earlier drafts. To all of them, we are indeed very grateful.

WE would also like to express our gratitude and appreciation to many other individuals who have contributed to this study. Mr. Chandramohan of the Palm Oil Registration and Licensing Authority provided us with the necessary critical data on tariffs imposed on Malaysian palm oil and other useful information on palm oil in the international market. We would like to thank him for his highly efficient deliverance of data and information despite the short notice given and his other work commitments. Mr. Arif Simeh from the Palm Oil Research Institute of Malaysia also provided as with useful data and suggestions. The chapter on tobacco would not have been as comprehensive without the help and assistance of Mr. Haji Abdul Wahab Jusof, the Director of Corporate Affairs, National Tobacco Board and Mr. Wan Azman Wan Ismail, senior researcher in tobacco at the Malaysian Agricultural Research and Development Institute. Both of them not only provided us with the necessary primary and secondary data required for this study but also helped us in acquiring a deeper understanding of the tobacco industry. To both of them again, our sincere thanks.

In the Economics and Technology Management Research Centre, we would like to thank our colleague, Mrs. Salbiah Husin, Head of Statistical Programs, for spending countless hours running the data and estimating the econometric models. We would to also like to thank our support staff, especially Mr. Azwan Mohd Salleh, Mr. Syed Abdillah Syed Alwi, Mr. Mohd Isa Hassan and other research assistants for taking extra effort in collecting and collating the large amount of data as well as providing overall technical support during the implementation of this study.

Ms. Titiek Pratiwi of UN-ESCAP CGPRT Centre, Bogor deserves a special mention for he excellent secretarial support to this project. Finally, we would like to express our appreciation to Mrs. Norzahrila Jamaluddin and Mrs. Norashikin Idris for their excelent services and dedication in typing this report.

Serdang, Selangor
June 30, 1999

Tengku Mohd Ariff Tengku Ahmad
Ariffin Tawang
Economic and Technology Management
Research Centre, MARDI
Kuala Lumpur

# Executive Summary

As the effects of agricultural trade liberalization begin to trickle down and start to affect farmers, many governments are realizing that they may have to go through painful adjustment programs that can be politically unpopular. The UR agreement also constrains the choice of policy instruments that can be used in pursuing their respective socio-economic and political agendas. The growing concern on the negative effects of agricultural trade liberalization is not without merit. In developed countries and more so in developing countries, governments are grappling with 'acceptable' plans to restructure the sub-sectors affected by liberalization.

For a developing country like Malaysia, where agriculture still plays a dominant role in the economy, agricultural trade liberalization is expected to affect the country not only on the economic and social fronts but also on the political front. A number of studies attempt to evaluate the effects of agricultural trade liberalization on Malaysia. However these studies mainly focus on macro aspects of the impact. Studies that analyze the impacts of liberalization at the micro level or the farm level are lacking. As a result, many questions concerning the impacts of liberalization on the individual farmer remain unanswered.

In this study, the effects of agricultural trade liberalization are analyzed from two main perspectives. The first is from a commodity perspective, where the effects of trade liberalization on the commodity with respect to prices, consumers' and producers' welfare were evaluated. Subsequently, the study analyzed the effects of liberalization on the farmers involved with the commodity. It also attempted to analyze the aggregate effects of liberalization on the areas where the farmers are located. This study covers palm oil, paddy and tobacco, the three crops in Malaysia that are likely to be most affected by the liberalization initiatives.

Palm oil is the largest agricultural industry in Malaysia. As an export-oriented industry, which is devoid of any subsidies, this industry is expected to register gains as a result of global liberalization of trade in the oils and fats market. The findings from this study confirm this expectation. Under a free trade environment, where tariffs by importing countries of Malaysian palm oil are zero, exports of Malaysian palm oil are expected increase by 1.973% (current weighted tariff of major importers = 15%). Using the 1996 data of exports of CPO equivalent of 7,587,855 tons, exports of CPO will increase by 149,708 tons under free market conditions. Prices of palm oil in the domestic market are expected to increase by about 3%, which translates into RM35 per ton of CPO equivalent. As such, consumers are expected to lose as a result of this increase in price. The consumer welfare loss is estimated to be in the region of RM28 million. However, producers are expected to register gains. Fresh fruit bunch (FFB) prices are predicted to increase by 3.2% leading to an increase in producer surplus of almost RM263 million. Hence the net gain from totally liberalized trade in palm oil for Malaysia is estimated to be RM235 million. Furthermore, Malaysia will gain from increased foreign exchange earnings resulting from the increased exports of palm oil. In addition, Malaysia's benefit can be further expanded due to the requirement of other oilseed producers to reduce support to their industries, which will most likely put upward pressure on prices of other edible oils such as soybean and corn oil. The higher prices of these products can result in a substitution effect that will be beneficial to palm oil.

Analysis of the likely effects of trade liberalization in palm oil at the farm level reveal that the net income of an average smallholder would increase by more than 9% or by RM147 per hectare per year. Considering that an average smallholder in an organized land scheme has about 3.5 hectares, the difference in income would be in the region of RM5000.

This study recommends that continuous efforts to increase productivity and efficiency of the industry be undertaken to enhance competitiveness of the industry in the long run. In addition increased efforts are also necessary to further promote the use of palm oil in order to better compete against other edible oils. Among the specific recommendations to enhance the industry are reducing labor requirements in the palm oil production process, enhancing competitiveness through productivity gains via R&D and quality improvements, product development and diversification, strengthening institutional support and market diversification and deepening.

The paddy sub-sector is one of the most highly protected agricultural sub-sectors in Malaysia with a high degree of market intervention. This protection is based on food security and socio-economic reasons, the paddy sub-sector being the sub-sector with one of the highest incidences of poverty in the country. Liberalization is expected to bring rationalization to the industry. Analyses in this study indicate that liberalization of the paddy and rice industry would, as expected, decrease domestic supply while increasing demand. There are all round efficiency and welfare gains that will benefit Malaysia, mainly brought about by the increase in consumer surplus and a decrease in government spending on subsidies. The total gain in consumer surplus brought about by liberalization is RM286.2 million, while the loss in producer welfare is estimated to be RM354.2 million. Hence net welfare loss is estimated to be RM68.0 million. However, there is a reduction in government expenditure to support the paddy price subsidy program, which is equivalent to RM553 million. Also, imports will increase quite significantly to cater to the increased demand-supply gap and farm incomes would be reduced by about 15%. Supply is predicted to decrease marginally by 1.34%.

Hence, from the analysis, it appears that the food security objectives might not be very much compromised even if total liberalization takes place. However the poverty and income issue is a more delicate issue to handle. While the analysis does not indicate a large reduction in farm income, any decline in the income of the poor without compensation, however small, can lead to serious political and social consequences. Furthermore, there is a strong possibility that the actual decline in income by this study might be underestimated, resulting from underestimation of the level of protection in the rice section (the TE). Analyses of farm profitability based on an actual survey of farmers indicated significant financial implications for the farmers. Depending on the tenure status and farm size, the farm income could be reduced by as much as 68% per season.

This study recommends several measures for the paddy and rice sub-sector to prepare for the challenge of liberalization. They include new and additional infrastructure in new areas, infrastructural improvements in existing areas to induce productivity and efficiency gains to increase competitiveness, farm consolidation and enhancing rural employment opportunities. In addition the study also recommends that institutional support be strengthened especially in the areas of R&D, extension and technology transfer.

The tobacco industry is another industry that receives high protection from the government through a web of policy interventions including high tariffs, production quotas, guaranteed minimum price, input subsidy and others. This protection is accorded with the aim of protecting the small producers, who are mainly located in relatively poor regions of the country. Due to the high degree of protection that the industry now enjoys, complete liberalization would most likely have serious consequences for the domestic industry. Estimates from this study indicate that the supply of green uncured leaves would be reduced by more than 73% with a producer loss amounting to RM17.32 million. Consumers would gain from cheaper tobacco and the net gain in consumer surplus is estimated to be RM58.88 million. Hence net welfare gain is estimated to be RM 56.74 million. However imports would jump by 12,758 tons with an estimated cost of RM170 million. In addition, the government would also lose about RM 500 million in revenue in terms of tobacco taxes.

Analysis at the farm level show that for the average farmer in a major tobacco growing area, operating a farm size of 0.175 hectares, gross income would be reduced to RM952 per season down from the pre-liberalization scenario of RM1,516. Net returns would turn negative although returns to labor are still positive at RM484.57. Net income would decline by almost 111%, while returns to labor decline by almost 54%. This reduction in income is due to the expected decline in the price of tobacco in the domestic market resulting from cheaper imports.

The following recommendations are put forward for the tobacco industry to face liberalization:

- Implementing a gradual structural adjustment program in the tobacco industry: The structural adjustment can start by gradually dismantling the tobacco tariff especially to ASEAN, so that the process of adjustments can now begin.
- Restructuring production: The tobacco industry in its present form is certainly non-viable. The curer system whereby uncured and cured tobacco production processes are separated and under different producer groups has led to high inefficiency in the industry. This system needs to be phased out and replaced with the grower-curer system or a system that will allow increased economy of scale and lower cost of production. Data from NTB, indicate that the average cost of cured tobacco under the grower-curer system ranges between RM6.85 and RM7.38 per kg, while that of the curer system averages RM11.41. The grower-curer system manages to cut the cost of production by almost 38%. With an average cost in the region of RM6.50, Malaysia would be in a better position to compete with Thailand, where cost of production was reported to be in the region of RM4.50/kg.
- Implementing an income support program: A de-coupled income support program would assist farmers in gradually picking-up new knowledge and venturing into other economic activities. This direct income support would only be given for a specified number of years, giving sufficient time for farmers to adjust to changing economic conditions and opportunities.
- Other facilitating programs: Other programs that will assist the industry include improving infrastructure in selected areas, focussing institutional support on adjustment programs, R&D on alternative crops and increasing productivity of tobacco under alternative production systems.

This study on the effects of liberalization on palm oil, rice and tobacco crops in Malaysia confirms the fact that local industries that are competitive will gain, while inefficient domestic industries will lose from the liberalization initiatives. Palm oil in Malaysia, reputed to be the most efficient in the world, will benefit in all aspects including increased exports, higher earnings to the industry and better competitive footing in the international market as other edible oil producers need to scale down support to their respective industries. Uncompetitive industries, such as rice and tobacco in the Malaysian case, will lose. These industries are expected to be 'naturally' downsized as the effects of liberalization work their way through the economy. Eventually there will be all-round efficiency gains to the economy as resources are re-allocated to the more productive sectors of the economy.

In facing the challenges and opportunities in agricultural trade liberalization, the approach that has to be adopted in further developing the industries must be market-based. Society-based strategies may no longer be applicable in this globalization era. Strategies and programs to develop specific enterprises may now need to be differentiated from social programs like helping the poor. Competitiveness is not the same as welfare.

One of the market-based strategies that developing countries like Malaysia need to adopt would be to strengthen the five pillars of economic foundation, i.e. infrastructure, finance and capital institutional support, R&D and technology as well as human resource development. Strengthening the economic foundation in a particular sector would enable the sector to be more efficient. Previous allocation used to support subsidies should now be re-allocated towards strengthening these foundations.

In summary the following recommendations that are globally applicable to all sectors can be considered:

- Strengthening the economic foundation to increase efficiency of agricultural industries;
- preparing for adjustments in the affected sectors including planning for income support programs;
- widening product range and value-added to increase product competitiveness and industry profits;
- enhancing marketing efforts for market diversification and deepening;
- re-structuring of production to allow farm consolidation and operation of better economy of scale; and
- increasing rural industrialization to create better employment and income-generating activities from competitive industries.

# 1. Introduction

Debate on the benefits and effects of trade liberalization continues until this day, even after more than three years since the signing of the Marrakesh Agreement and the formation of the World Trade Organization (WTO) to facilitate and implement trade liberalization world-wide. The signing of the agreement is in reality a testimony of consensus by signatory countries that freer trade is beneficial to everybody. However, despite the consensus, debate on the advantages and disadvantages of trade liberalization not only continues but is also gaining momentum. This is especially so for liberalization in the agricultural sector, a sector which is deemed strategic by many countries in both the developing and the developed worlds.

As the effects of agricultural trade liberalization begin to trickle down and start to affect farmers, many governments realize that they might have to go through painful adjustment programs that can be politically unpopular. The agreement also constrains the choice of policy instruments that can be used in pursuing their respective socio-economic and political agendas. Many are now resisting the liberalization initiatives as the detailed implications of more liberalized trade are now clearer. The growing concern on the negative effects of agricultural trade liberalization is not without merit. In developed countries and more so in developing countries, governments are grappling with 'acceptable' plans to restructure the sub-sectors affected by liberalization. Most of these plans make use of certain 'loopholes' in the Agriculture Agreement to in fact continue to indirectly support agriculture. In developed countries, complex mechanisms that are not so 'GATT-unfriendly' are being used as devices to continue supporting agriculture. The United States of America (USA) for example is coming up with an 'Income Adjustment Program' that guarantees a specific income for a number of years for farmers affected by agricultural trade liberalization.

For a developing country like Malaysia, where agriculture still plays a dominant role in the economy, agricultural trade liberalization is expected to affect the country not only on the economic and social fronts but also on the political front. A number of studies that attempt to evaluate the effects of agricultural trade liberalization on Malaysia have been carried out (Tengku Ariff 1998; Mohamed Ariff et al. 1996). The study by Tengku Ariff (1998), which is the first part of the present study, provided a comprehensive description of the institutional and structural aspects of agricultural trade liberalization and also agricultural policy evolution in Malaysia. The author also analyzed the likely effects of agricultural trade liberalization on Malaysian agriculture in general and also on specific important agricultural sub-sectors. The next section provides a summary of that study in order to provide continuity and better comprehension of this publication to the reader.

## 1.1 Institutional and structural aspects of agricultural trade liberalization in Malaysian agriculture

The study by Tengku Ariff (1998) predicted that major gains for Malaysia from liberalization are only expected from the exports of palm oil and wood products. Both the USA and EU that are the major markets for Malaysian palm oil are expected to reduce their tariffs by 19% for unprocessed or semi-processed and 30% for processed oils and fats. It was also reported in the study that developing countries, which are becoming more important markets for Malaysian palm oil, are also reducing their tariffs on palm oil imports. Thailand and the Philippines, for example, are reducing them by 24% and 12%, respectively. The study also found that the reduction in tariff escalation for wood products in developed countries would also benefit Malaysia. Other export crops including cocoa, rubber, and pepper are only expected to register modest gains since Malaysia's competitiveness in exporting these products in the future is uncertain, and further declines in exports of these commodities are expected.

The study found that, in general, the Agricultural Agreement is not expected to bring radical changes in the import tax regime for Malaysia's agricultural products, since Malaysia's import tariffs for agricultural products are already low. However, the study added that the Agreement could severely affect the rice industry when all direct supports including the price support are withdrawn from the industry. Many producers are expected to exit the industry as profit margins decrease. Unless the government undertakes massive infrastructural upgrading to increase current productivity levels, rice production is also expected to decline.

The study also predicted that other protected subsectors such as tobacco, poultry and swine are not expected to be significantly affected by the Agreement. However, the CEPT (Common Effective Preferential Tariff) scheme of ASEAN is expected to inflict significant impacts on these industries, especially on the local tobacco industry. At the pessimistic end, full implementation of the CEPT scheme for agricultural products, may see a total collapse of the industry, as most ASEAN countries are more cost-effective producers of tobacco. The study concluded that, overall, the balance of gains and losses in agriculture for Malaysia will very much depend on the in-roads that will be made by Malaysian palm oil as Malaysia will lose in terms of higher import prices and imports of food.

Some recommendations were also put forward in the study for Malaysia in pursuing the agricultural trade liberalization agenda. These include the need for a well planned strategy to prepare for adjustments in the protected and most affected subsectors, increasing capacity for food production, expanding value added and downstream processing, and a quality enhancement program. It may also be necessary for Malaysia to join forces with other smaller countries to exert increased influence on the outcome of the trade liberalization negotiation process.

## 1.2 Scope and objectives of the study

Past studies on trade liberalization in agriculture in Malaysia mainly focused on the macro aspects of the impact. Studies that analyze the impacts of liberalization at the micro level or the farm level are lacking. As a result, many questions concerning the impacts of liberalization on individual farmer remain unanswered. This study will attempt to answer some of these questions.

In this study, the effects of agricultural trade liberalization are analyzed from two main perspectives. The first is from a commodity perspective where the effects of trade liberalization on the commodity with respect to prices, consumers' and producers' welfare are evaluated. Subsequently, the study will proceed to analyze the effects of liberalization on the farmers involved with the commodity. It will also attempt to analyze the aggregate effects of the liberalization moves on the areas where farmers are located. This study will cover three major commodities as well producers involved with these commodities. They are palm oil, paddy and tobacco. The analyses of effects will be viewed from the outcomes of implementing both the Agricultural Agreement of the Uruguay Round and also the CEPT scheme of AFTA (ASEAN Free Trade Area). Malaysia is a signatory to both the agreements.

Specifically the objectives of this study are:

- to analyze the effects of trade liberalization on the performance of palm oil, paddy and tobacco in terms of production, import and exports,
- to estimate changes in consumers' and producers' welfare resulting from trade liberalization in the palm oil, paddy and tobacco sub-sectors,
- to identify micro issues and challenges resulting from agricultural trade liberalization, and

- to formulate recommendations to the Malaysian government on adjustment strategies for the affected agricultural sub-sectors.

## 1.3 Organization of the study

This study is organized into six chapters. Chapter one describes the rational and objectives of this study. Chapter two describes the general status of the agricultural sector in Malaysia and the challenges that are facing the sector. The subsequent three chapters are devoted to the specific commodity and location studies. Methodologies employed to analyze each of the commodities and location-specific studies are dealt with in the respective chapters. In the last chapter important issues and challenges facing agricultural trade liberalization are highlighted. This is then followed by recommendations to the government and industry players on strategies for dealing with agricultural trade liberalization.

# 2. Overview of the Malaysian Agricultural Sector

## 2.1 Introduction

This chapter describes the Malaysian agricultural sector with regard to its position in the economy, the structural composition of the sector, trade and other important macroeconomic parameters. It will also briefly describe some policy measures undertaken by government in the sector in general and also specific measures undertaken in some sub-sectors that are deemed strategic and of socio-economic importance. The last section describes the current major issues and challenges facing the Malaysian agricultural sector with emphasis on the financial crisis that has struck the country and the region.

## 2.2 Contribution of the agricultural sector

In 1995, the contribution of the agricultural sector to national gross domestic product (GDP) was 13.5%. As in any country that is experiencing industrialization, the relative contribution of agriculture to the economy has been steadily declining. This has been especially rapid in the last 10 years, when agriculture's contribution to GDP declined from 20.8% in 1985 to 13.5% in 1995 (Table 2.1). Reflecting the deliberate efforts by government to industrialize, the share of manufacturing to national GDP jumped from 19.7% in 1985 to 33.1% in 1995. Agriculture in Malaysia was said to be suffering from a booming-sector syndrome by some analysts during this era, where the growth of other sectors of the economy by far out-grew the contribution of the agricultural sector (Nik Fuad 1990).

With the dwindling contribution to GDP, percentage employment in the agricultural sector vis-a-vis other sectors also declined. Between 1985 and 1995 agricultural employment to total employment declined from 31.3% to 18.0%, while employment in the manufacturing sector stood at 25.9% in 1995. Nevertheless, total absolute employment in agriculture expanded from 5.74 million workers to 7.9 million workers during the same time period.

**Table 2.1 GDP contribution (%) by sector, 1985 and 1995.**

| Sector | 1985 | 1995 |
|---|---|---|
| Agriculture | 20.8 | 13.5 |
| Manufacturing | 19.7 | 33.1 |
| Construction | 4.7 | 4.5 |
| Mining | 10.5 | 7.5 |
| Services | 44.3 | 41.4 |

Sources: Economic Planning Unit, Prime Minister's Department, Malaysia Five-Year Plans: various issues.
Note: The calculated is based on real GDP at 1978 prices.

## 2.3 Composition of Malaysia's agricultural sector

The Malaysian agricultural sector is mainly dominated by industrial export crops comprising oil palm, rubber and cocoa. Together, these three crops account for about 77% of the total agricultural land use in the country (Table 2.2). This structural composition of Malaysia's agricultural sector, with the industrial export crops dominating the landscape of

Malaysian agriculture, has been in existence for the last three and a half decades. The other dominant crops in terms of landuse are the food crops consisting of paddy, coconut and fruits, while other crops such as tobacco, coffee, tea, sugarcane and sago occupy only a small percentage of the total agricultural land.

Reflecting the dominance of the primary export crops in agricultural landuse, their percentage contribution to agricultural GDP (including sawlogs) was 71% in 1995 (Table 2.3). The contribution from palm oil alone represented 42% of total value-added of the sector. Its contribution has in fact increased from 30.5% in 1985 to 42.1% in 1995. Food products on the other hand contributed less than 30% to total agricultural value-added in 1995. Food crops (paddy, fruits and vegetables) contributed just 10% to agricultural GDP.

**Table 2.2 Agricultural landuse (ha), 1995.**

| Item | 1995 |
|---|---|
| Rubber | 1,679,000 |
| Oil Palm | 2,539,900 |
| Cocoa | 190,700 |
| Paddy | 667,563 |
| Coconut | 248,900 |
| Pepper | 10,200 |
| Vegetables | 42,240 |
| Fruits | 257,654 |
| Tobacco | 10,525 |
| Others | 90,356 |
| Total | 5,737,038 |

Sources: Economic Planning Unit, Prime Minister's Department, Malaysia; Department of Statistics, Malaysia.

Notes: Paddy, vegetables and tobacco are based on planted area. Others include sugarcane, coffee, sago, tea and floriculture.

**Table 2.3 Agricultural value-added, 1995 (RM million in 1978 prices).**

| Item | 1995 | |
|---|---|---|
| | RM million | % |
| **Industrial Crops** | **11,523** | **71.0** |
| Rubber | 1,717 | 10.6 |
| Oil palm | 6,842 | 42.1 |
| Sawlogs | 2,255 | 13.9 |
| Cocoa | 709 | 4.4 |
| **Food Commodities** | **4,250** | **26.2** |
| Paddy | 672 | 4.1 |
| Fruits | 476 | 2.9 |
| Vegetables | 503 | 3.1 |
| Fisheries | 1,823 | 11.2 |
| Livestock | 776 | 4.8 |
| **Miscellaneous** | **457** | **2.8** |
| **Total** | **16,230** | **100.0** |
| Share of Agriculture to GDP (%) | 18.7 | 13.5 |

Source: Department of Statistics, Malaysia.

In general, the Malaysian agricultural sector is still narrowly based. Although a range of diversified product groups can be discerned from the sectoral output, a substantial portion of the output still comes from the primary export crops. As such, a small change in output prices of these commodities can significantly affect the output of Malaysian agriculture.

## 2.4 Agricultural trade

Malaysia is basically a trading nation and can be considered as one of the most liberalized economies in the region. The country's fiscal, financial trade and investment policies have always been geared to creating an open competitive economy for participation by both local and foreign investors. However, in September 1998, the country imposed limited capital controls and instituted exchange controls. The Malaysian ringgit is now no longer tradable outside of Malaysia and is fixed to the US dollar at RM3.8. This is to prevent further speculative attacks on the currency, which can subsequently lead to a complete meltdown of the currency and also the economy. Nevertheless, trading transactions remained unhampered by the exchange controls.

The volume of trade expanded almost six-fold between 1985 and 1996, from RM68.5 billion in 1985 to almost RM394 billion in 1996. The ratio of both exports and imports to GDP was about 0.79 in 1996, reflecting the significance of international trade to the economy. Trade in agriculture and agricultural products stood at RM52.4 billion in 1995. Of this, exports amounted to RM35.4 billion, while imports were about RM17 billion. Malaysia's agricultural trade balance always registered surpluses in the 1985 - 1995 period, growing from RM8.8 billion to RM18.5 billion over the period. It was these surpluses from agriculture that narrowed the Malaysian overall trade deficit during the last three years (1994 - 1996).

## 2.5 Composition of agricultural trade

The composition of imports and exports in most cases reflects the country's comparative advantage in production and trade of commodities. Most of Malaysia's agricultural exports consist of primary commodities comprising products from palm oil, rubber, cocoa and sawlogs. In 1995, these products accounted for 76.2% of total agricultural exports (Table 2.4).

**Table 2.4 Share of Malaysia's agricultural exports by major commodity, 1995.**

| Item | Share (%) |
|---|---|
| Food | 12.7 |
| Palm oil | 29.3 |
| Rubber | 11.4 |
| Sawlogs | 6.4 |
| Sawn timber | 10.8 |
| Other forest products | 18.3 |
| Agricultural requisites | 1.5 |
| Others | 9.6 |

Source: Department of Statistics, Malaysia.

Reflecting the relatively low level of food production, agricultural imports consist mainly of food products. In 1995, total food imports amounted to almost RM8.0 billion. They have since increased to RM10.0 billion in 1997. Major imports comprise wheat, maize, sugar, rice, dairy and meat products (Table 2.5).

**Table 2.5 Value of imports of foodstuffs in 1995 (RM1,000).**

| Item | 1995 | % |
|---|---|---|
| Total imports | 7,663.6 | 100.0 |
| Live animals | 140.2 | 1.8 |
| Meat & meat preparations | 381.1 | 5.0 |
| Dairy products | 951.9 | 12.4 |
| Fruits | 444.3 | 5.8 |
| Vegetables | 683.4 | 8.9 |
| Rice | 356.1 | 4.6 |
| Other cereals | 1,688.1 | 22.0 |
| Fish, crustaceans, molluscs & preparations thereof | 762.4 | 9.9 |
| Others | 2,256.1 | 29.6 |

Source: Department of Statistics, Malaysia.

## 2.6 Policy intervention in the agricultural sector

Tengku Ariff (1998) has provided a comprehensive description of policy interventions in the agricultural sector in Malaysia. This section provides a brief review of that description in order to provide a better comprehension of this publication to the reader.

In the early years since independence, agricultural development strategies mainly focused on providing employment, and earnings and savings of foreign exchange. Considering that there was a high incidence of poverty in the agricultural sector, strategies and programs during the early period were also designed to raise farm incomes. The country aggressively pursued expansionist policies on export crops such as rubber, oil palm and cocoa and also import-substituting strategies to earn and save foreign exchange, and create employment and income-earning opportunities (Ministry of Agriculture 1999).

Many sub-sectors in agriculture were protected through tariffs and non-tariff barriers such as quotas and other import barriers. High emphasis was given to food security, where a 100% self-sufficiency target was set for domestic rice production. At the same time, the export crop sub-sector was heavily taxed to provide revenue to the government to finance its operating and development costs. The government also undertook heavy investments in infrastructural development, institutional building and new land development.

The First National Agricultural Policy launched in 1984 marked the actual beginning of liberalization of the agricultural sector, although the country had already started to reduce tariffs for intermediate products and raw materials during the Second (1971 – 1975) and Third Malaysia Plan periods. This was aimed at stimulating manufactured export activity (Samion Abdullah and Tengku Ariff 1990; Tengku Ariff 1998). The policy’s main objective was to maximize income from agriculture through the efficient utilization of the country’s resources and increase in productivity. The main strategies employed still emphasized new land development together with in-situ development. Agricultural support services, such as research and development (R&D), extension and marketing, were also given emphasis.

The period of 1984 - 1990 marks an important threshold in the transformation and development of the Malaysian economy. This era saw rapid expansion of the manufacturing sector that altered the relative importance of the agricultural sector. Although value-added in agriculture grew at an average rate of 4.6%, this is less than half of the manufacturing sector, which grew at a rate of 13.7%. Overall development of the agricultural sector was beset with problems including more favorable policies towards manufacturing, labor shortages and increasing wages, increasing competition for land for other uses and others. Subsequently, the First National Agricultural Policy (NAP) was reviewed and a second NAP (1992 - 2010) was introduced. Greater emphasis was given to addressing productivity, efficiency and competitiveness issues in the context of sustainable development and linkages with other sectors of the economy, in particular, the manufacturing sector (Ministry of Agriculture 1992).

This is in contrast with the first NAP, which gave greater attention to new land development and the creation of employment opportunities. Development efforts were geared towards modernization and commercialization, especially of the unorganized smallholders to enhance the sector's economic/structural integration with the rest of the economy, particularly the manufacturing sector.

Efforts to further liberalize the agricultural sector were intensified. The food security issue was further rationalized. Reflecting this move, the self-sufficiency target for rice was revised downwards to 65% and import taxes on many agricultural products were substantially reduced. The policy also calls for increased exports of higher value-added agricultural products, such as floriculture as well as fruits and vegetables. Interventions were replaced with incentives. In 1986, the Promotion of Investment Act (PIA) was introduced to promote investment and growth in the economy. The incentives of the PIA provide either partial or total relief from income tax payments. Many industries including agriculture benefited from the PIA, although its effects on smallholder agriculture may not be as significant as on industries.

### 2.6.1 Tariff and non-tariff barriers

Malaysia has a fairly liberal trade regime with low tariffs for most products. In 1993, the simple average and ad volorem tariffs were 14%. The average was lower for agriculture at 10.4%, while for industry it was 14.4%. The level of tariff protection is revised regularly to harmonize the tariff structure and reduce excessive protection. In most cases, tariffs on products are revised downwards, except for products that are considered luxurious and unhealthy, such as luxury cars, cigarettes and alcohol.

The government protects a number of agricultural industries for strategic and socio-economic reasons. In many cases this protection is in industries where there are still a large number of poor households. The protection accorded is to rice, specific livestock sub-sectors, tobacco and tropical fruits, coffee and cabbages.

In rice, a web of policy interventions aims to regulate and protect the industry. These are mainly for food security and to enhance the income of farmers in rice production. The interventions include monopoly on imports, guaranteed minimum price (GMP) for paddy, controlled prices at milling, wholesale and retail, fertilizer subsidy, price support, provision of drainage and irrigation facilities and R&D support.

The tobacco subsector, apart from being protected by high tariffs, also received other forms of support and protection from the government. The National Tobacco Board (NTB) served as the lead agency to implement policy instruments in the industry. The major interventions in the industry include (i) licensing of all curers and cigarette manufactures and registering growers, (ii) implementing production quotas to balance production with demand, (iii) setting proper grading and pricing of green and cured leaves, (iv) controlling and regulating the marketing of green and cured leaves, (v) providing input credit and extension services to curers and growers as well as (vi) training for staff, growers, curers and station workers from relevant agencies.

In livestock, three industries are still accorded protection. They include the poultry industry covering products such as live poultry and meat including fresh, chilled or frozen as well as poultry eggs. Prior to the Uruguay Round Agreement, imports of these products faced a total ban. Now these products are bound at a rate between 23% and 85%. However, the applied rate of duty is zero. The minimum market access of 3% of domestic consumption is now allowed for these products, which will be increased to 5% by 2004. The swine industry is also similarly protected. Live swine and meat of swine are bound at rates between 23% and about 139%. Again, as in the case for poultry, the applied tariff rate is also zero. In dairy, tariffs for most products are in the region of 5%. However, fresh milk is subject to import restriction under the minimum market access clause.

Tropical fruits such as bananas, pineapples, mangosteens, melons and papayas are also protected behind high tariff walls. The tariffs for these products range from RM 220.45 plus another 5% for mangoes to a high of RM1,322.77 per ton plus another 5% for bananas. These high tariffs are also to protect producers, who are small farmers.

Coffee and round cabbages are also subject to import restrictions. For coffee, however, most imports are allowed although import licensing is still not automatic. Round cabbages are still subject to quantitative restrictions, but the amount of cabbages imported into the country sometimes exceeds domestic production and is way above the requirement of GATT.

## 2.7 Issues and challenges facing Malaysian agriculture

The Third National Agricultural Policy (1998 – 2010), launched in 1999 identified several major issues and challenges facing Malaysian agriculture. They are summarized below.

- Supply and accessibility of safe, nutritious and high quality food at affordable prices: Malaysia is quite dependent on external sources for its food supply. The country's food import bill is continuously increasing and in 1997 amounted to RM10.0 billion, up from RM4.6 billion in 1990. The high demand for food coupled with a relatively low domestic supply has led to increases in food prices. In 1997, increased prices of food accounted for 51.9% of the increase in Consumer Price Index (CPI).
- Shortage of land and labour: The agricultural sector continues to experience a shortage of labor. Higher wages afforded by other sectors resulted in an outflow of farm labor to the other sectors of the economy. Consequently, there is now high employment of immigrant workers in the agricultural and forestry sectors. In 1995, it was estimated that there were about 432,000 immigrant workers in this sector, accounting for 41% of total immigrant labor in the country. However, despite the employment of immigrant labor, the plantation sector is still short of workers. Due to this shortage, it is estimated that about 300,000 hectares of rubber holdings are untapped. Shortage of farm labor has also resulted in substantial areas of idle land, estimated to be in the region of 400,000 hectares. However, suitable agricultural land is also becoming more limited due to conversion for other uses such as industrial, residential and urban uses.
- Competitiveness and productivity: Malaysian agricultural products are facing increasing competition not only in the international market but also in the domestic market. This is due to the implementation and the coming into force of the various agricultural trade liberalization agreements including the Agriculture Agreement of the Uruguay Round and the CEPT scheme of AFTA. Major export commodities such as rubber and palm oil face increasing competition from emerging lower cost producers in the international market, while in the domestic market crops such as tobacco, that are now heavily protected, will soon face competition from imports from its ASEAN neighbors. There is an urgent need for the Malaysian agricultural sector to enhance its productivity and efficiency to improve its comparative advantage and increase competitiveness. Productivity gains in agriculture have also not matched increases in factor prices. Labor productivity increased by only 5.9% per annum during the 1990 - 1995 period, while farm wages increased by 48.6% from 1993 to 1995 (Ministry of Agriculture 1999).
- Strengthening industrialization in agriculture: Apart from being quite dependent on imports for food products, Malaysia is also highly dependent on imported raw materials, especially for its food processing industries. Seventy percent of total raw materials used in the food processing industry are imported (Ministry of Agriculture 1999). Inconsistent supply and lack of domestic production resulted in many small and medium-scale firms operating below capacity. At the same time the development of high value-added resource-based products is also limited. Exports consist mainly of

primary and intermediate products. This points to the fact that inter and intra-sectoral linkages especially with support and downstream industries are still weak.

Apart from the above issues and challenges, the bigger challenge that is facing not only agricultural development but the Malaysian economy as a whole is the financial and economic crisis that has hit Malaysia and this region since late 1997. This crisis is the single most important development since the recession in the late 1980s and its impact on the future economic performance of the region has already resulted in compounding effects.

### 2.7.1 The financial crisis and its impact on Malaysian agriculture

Triggered by speculative attacks on the Thai baht due to deceleration in exports and falling asset prices in Thailand in 1997, the financial crisis spread to other economies in the region including Malaysia. These speculative attacks led to a rapid outflow of short-term capital from Malaysia and other regional economies. This subsequently resulted in severe reduction in asset values and currency exchange rates and deterioration in investor confidence.

The financial crisis had wide-ranging effects on Malaysia. It weakened the financial sector, affected the real economy and had socio-economic implications (Economic Planning Unit 1999). Prior to the crisis, the Malaysian economy had been enjoying a rapid growth rate, averaging 8.5% annually since 1990. As the crisis deepened, real output declined. It contracted at an unprecedented rate of 6.7% in 1998. Inflation rose to 5.3% and unemployment increased by almost 4.0%.

In agriculture similar macro-effects were felt. Between 1996-1998 agricultural output declined by 0.2% compared with a targeted growth of 2.4% in the Seventh Malaysian Plan. Much of the contraction was due to the decline in output in 1998. Abdul Aziz (1999) analyzed several effects the crisis had on agriculture. These include the loss of value of plantation stocks in the Kuala Lumpur Stock Exchange, reduced government operating and development budgets for agriculture, decline in loans and funds for agricultural investment, contraction in private consumption of agricultural products and business failures.

The sector was also burdened with higher import input prices resulting from depreciation of the currency. This included prices for feedstuffs, fertilizers and other agricultural chemicals, machinery and equipment. This also led to an increase in cost of not only imported food but also of domestically-produced commodities including flour products, animal feeds, poultry, horticultural products and processed food. Overall, imports increased from about RM7.9 billion in 1995 to almost RM10.0 billion in 1998. The trade balance in the food sector continued to widen even further in favor of imports.

Unless there is a quick recovery, the financial crisis will most likely have significant effects on trade flow. First, the depreciation of the Malaysian currency (which is now fixed at RM3.8 to the US dollar) is more than 30% lower than the pre-crisis value. This will make the cost of imported goods at least 30% higher. Thus, tariff reduction on imported products would be negated by this increase in import price. Second, the crisis resulted in a real contraction of the economy. Unemployment increased and real income declined, resulting in a decline in demand for imported goods. The Economic Planning Unit (1999) reported that both exports and imports decelerated during the 1996 - 1998 period, very much due to the slowdown of trade in 1998. Real exports grew by only 5.6% during the same period, much lower than the 17% - 23% during the second half of the Sixth Malaysian Plan (1991 - 1995). In 1998, exports actually registered a negative growth of 0.7% due to a slowdown in demand in regional markets, which are also hit by the crisis, and Japan. Imports also declined (by 2.1%) during the 1996-1998 period. Hence, it appears that the trade liberalization initiatives, which are supposed to increase overall trade globally, have been hampered by the financial crisis that has hit the regional economy.

However, recent developments show some positive signs towards recovery. Foreign funds are coming back into region, including Malaysia, despite the selective capital control measures that it now practices. Investor confidence is beginning to be restored as the financial sector is now going through a process of reformation.

Despite Malaysia's bad experience resulting from an economy that previously could be considered too open, it is unlikely that the government is going to fall back to protective trade. Trade liberalization initiatives are likely to continue. However, in agriculture, the government is attempting not to be over-dependent on imports especially for food products. If is now initiating a new round of import-substituting measures through market-based strategies (Ministry of Agriculture 1999). These include strengthening the economic foundation such as infrastructure, finance and support services for food production. These strategies are aimed at increasing the efficiency and productivity of domestic food production to make it competitive in the long run. Nevertheless, regardless of the steps taken and even if the economy of this region makes a quick recovery, the flow and volume of international trade has surely been set back as a result of this crisis.

# 3. Palm Oil

## 3.1 Introduction

The core content of this chapter is an analysis of the impact of trade liberalization on the Malaysian palm oil industry. The analysis includes the effects of liberalization on the commodity and also at a specific location, a Federal Land Development Authority (FELDA) palm oil-based land scheme. A detailed description of the theoretical and methodological framework for the effects on palm oil prices, production, export demand, producer and consumer surpluses is also presented. In evaluating the effects on farmers of the FELDA land scheme, a partial budgeting approach is used, whereby scenarios with and without liberalization are presented.

This chapter starts with a description of the Malaysian palm oil industry in terms of structure of production, production, trade, milling and refining. This is then followed by a section on the policies, strategies and programs undertaken by government and the private sector for palm oil. The next section reviews some literature on the subject of trade liberalization in palm oil. Subsequently the commodity effects resulting from trade liberalization are analyzed. This is then followed by an analysis of effects on producers at a selected location, i.e. the FELDA land development scheme. Finally, policy recommendations and strategies for facing the opportunities and challenges of trade liberalization in palm oil in Malaysia are put forward.

## 3.2 The Malaysian palm oil industry

The palm oil industry is the largest agricultural enterprise in Malaysia. It has evolved from just producing crude palm oil (CPO) to a more diversified industry, consisting of milling, refining and manufacturing of various food and non-food products such as cooking oil, soaps and oleochemicals. The oil palm, dubbed the 'golden-crop' of the country, has witnessed phenomenal growth since the 1960s. Since its introduction, this crop has permanently changed the landscape of agriculture in this country by replacing most of the rubber areas and through new area development. It has successfully enhanced the incomes of agricultural smallholders through government land schemes managed by FELDA and also other federal and state government agencies. Apart from the government programs, stable prices and sustained long-term industry profits have led the private sector to extensively venture and invest in palm oil. At present, there are 2.5 million hectares of oil palm under both smallholders and private estates involving 250,000 families and employing an estimated 80,000 workers. Malaysia has for many years been the top producer and exporter of palm oil in the world.

### 3.2.1 Area and production

Total area under oil palm expanded from 641,791 hectares in 1975 to 2,692,286 hectares in 1996, increasing more than four-fold and growing at a steady rate of 6.8% per annum (Table 3.1). Of the total planted area in 1996, about 70% was in Peninsular Malaysia and 30% was in Sabah and Sarawak. As new land area in Peninsular Malaysia is becoming more limited, new development of oil palm areas is increasingly coming from Sabah and Sarawak in East Malaysia.

**Table 3.1 Oil palm planted area (ha), Malaysia, 1975 - 1996.**

| Year | P. Malaysia | Sabah | Sarawak | Total |
|---|---|---|---|---|
| 1975 | 568,561 | 59,139 | 14,091 | 641,791 |
| 1980 | 906,590 | 93,967 | 22,749 | 1,023,306 |
| 1985 | 1,292,399 | 161,500 | 28,500 | 1,482,399 |
| 1990 | 1,698,498 | 276,171 | 54,795 | 2,029,464 |
| 1991 | 1,744,615 | 289,054 | 60,359 | 2,094,028 |
| 1992 | 1,775,633 | 344,885 | 77,142 | 2,197,660 |
| 1993 | 1,831,776 | 387,122 | 87,027 | 2,305,925 |
| 1994 | 1,857,626 | 452,485 | 101,888 | 2,411,999 |
| 1995 | 1,903,171 | 518,133 | 118,783 | 2,540,087 |
| 1996 | 1,926,378 | 626,008 | 139,900 | 2,692,086 |

Sources: Palm Oil Registration and Licensing Authority; Department of Statistics, Malaysia.

Table 3.2 shows a breakdown according to category of producer. Of the total area, 52.08% belongs to private estates or plantations. The bulk of the area under smallholders is under federal and state government land schemes, which make up another 39% of the land area. Independent smallholders only own about 9% of the total area.

**Table 3.2 Distribution of oil palm area by category of producer, 1996.**

| Category | Hectares | Percentage |
|---|---|---|
| Private estates | 1,402,196 | 52.08 |
| Government schemes: | | |
| FELDA | 682,867 | 25.36 |
| FELCRA | 113,074 | 4.20 |
| RISDA | 38,485 | 1.43 |
| State government schemes | 216,740 | 8.05 |
| Independent smallholders | 238,924 | 8.88 |
| Total | 2,692,286 | |

Source: Palm Oil Registration and Licensing Authority.

In parallel with the increase in planted area, CPO production also increased. Between 1975 and1996, CPO production increased from 1.26 million tons to 8.39 million tons (Table 3.3). This represents nearly a seven-fold increase with a growth rate of 9.0% per annum within the period. The production of crude palm kernel oil (CPKO) also increased, from 108,000 tons to 1,107,000 tons during the period.

**Table 3.3 Production of CPO and CPKO ('000 tons), Malaysia, 1975 – 1996.**

| Year | CPO | CPKO |
|---|---|---|
| 1975 | 1,258 | 108 |
| 1980 | 2,573 | 222 |
| 1985 | 4,135 | 511 |
| 1990 | 6,095 | 827 |
| 1991 | 6,141 | 782 |
| 1992 | 6,374 | 812 |
| 1993 | 7,404 | 966 |
| 1994 | 7,221 | 978 |
| 1995 | 7,811 | 1,037 |
| 1996 | 8,386 | 1,107 |

Source: Palm Oil Registration and Licensing Authority.

### 3.2.2 Marketing of palm oil

The marketing of palm oil is shown in Figure 3.1. Producers who mainly consist of private estates and organized smallholdings (such as FELDA) usually have an in-house marketing support system to facilitate the marketing and distribution of palm oil. They have a good transportation system, and close links with refineries, crushing factories and bulk installations. The major producers also have an established network with domestic brokers/dealers who sell the processed products to the domestic market or international traders (Syed Abdillah 1991). Some producers also sell their fresh fruit bunches (FFBs) to contract buyers. Independent smallholders, on the other hand, usually sell FFBs to collectors or middlemen operating in the region. These middlemen in turn sell the FFBs to palm oil mills in the area. From the mills, the crude palm oil is sent to refiners and other palm oil processors. Up the marketing channel are the international brokers, dealers and other selling agents, who in turn sell the palm oil products to importers and other end users.

### 3.2.3 Trade

Most of the palm oil produced is for export. For the last ten years 80% - 90% of production was exported. Exports of CPO and processed palm oil (PPO) from Malaysia have increased in tandem with the increase in production. Total exports of palm oil have increased from just 1.2 million tons in 1975 to 7.2 million tons in 1996, expanding at a rate of 8.5% per annum (Table 3.4). In 1996 export earnings from CPO and PPO alone amounted to more than RM9 billion. The industry is one of top export earners for the country.

The main export markets for Malaysian palm oil are Pakistan, India, EU, China, Japan and Singapore. Apart from palm oil, Malaysia also exports oleochemical products. With encouragement and incentives by the government in the production of oleochemicals, exports of these products have increased from 153,000 tons in 1985 to 535,928 tons in 1996 with an export value of more than RM1.2 billion.

**Table 3.4 Exports of CPO and PPO ('000 tons), Malaysia, 1975-1996.**

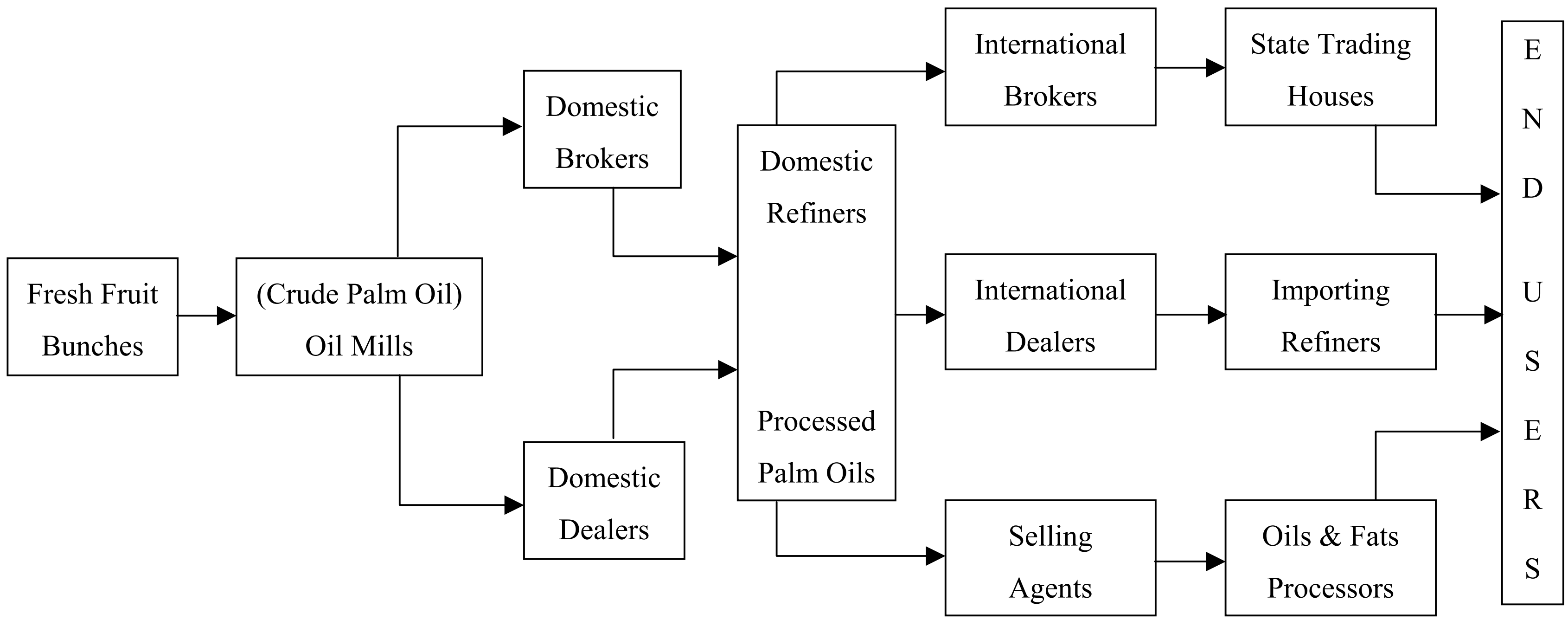
| Year | CPO | PPO | Total Palm Oil |
|---|---|---|---|
| 1975 | 957 | 216 | 1,173 |
| 1980 | 198 | 2,074 | 2,272 |
| 1985 | 13 | 3,421 | 3,434 |
| 1990 | 93 | 5,634 | 5,727 |
| 1991 | 90 | 5,483 | 5,573 |
| 1992 | 71 | 5,493 | 5,564 |
| 1993 | 59 | 6,059 | 6,118 |
| 1994 | 55 | 6,695 | 6,750 |
| 1995 | 17 | 6,496 | 6,513 |
| 1996 | 69 | 7,143 | 7,212 |

Source: Palm Oil Registration and Licensing Authority (PORLA).

### 3.2.4 Milling, refining and other downstream industries

Careful planning coupled with pragmatic policies to stimulate the development of the palm oil industry has enabled it to expand, deepen and diversify. Now the industry is well clustered with a whole range of business support services, product manufacturing, R&D and marketing activities in place. The imposition of the export tax on CPO has effectively curtailed its exports and has encouraged the processing of high value-added activities from palm oil. Table 3.5 reflects the expansion in the downstream activities of palm oil. These activities include milling, refining and oleochemical processing plants.

**Figure 3.1 The marketing channels of Malaysian palm oil.**




Source: Syed Abdillah 1991.
Note: Finished products: cooking oil, shortening, margarine, confectionery fats, cocoa butter substitutes, soaps, detergents, emulsifiers, resins, stearic acids, etc.

**Table 3.5 Number and capacity (million tons/yr) of operational palm oil processing facilities, 1985 - 1997.**

| Year | Mill | | Refinery | | Oleochemical | |
|---|---|---|---|---|---|---|
| | Number | Capacity | Number | Capacity | Number | Capacity |
| 1985 | 229 | 35.12 | 38 | 5.34 | 5 | 0.28 |
| 1990 | 261 | 42.87 | 37 | 10.45 | 7 | 0.39 |
| 1997 | 308 | 56.03 | 44 | 12.30 | 13 | 0.82 |

Source: Palm Oil Registration and Licensing Authority.

The number of mills and refineries increased from 229 and 38 in 1985 to 308 and 44, respectively, in 1997. Increased downstream processing is also reflected in the number of oleochemical plants in operation and also their capacity of production. During the same time period the number of oleochemical plants increased from just five to 13, with an increment in processing capacity of more than 500,000 tons. Apart from these three core activities, the industry is also involved in manufacturing other finished palm oil products including vegetable ghee, margarine, shortening, soap and others. The export value of these finished products reached almost RM151 million in 1997. Other products that are of value but that can be considered by-products of the industry include palm kernel cake and sludge oil. There are also various other products that can be produced from palm oil, which are in various stages of the R&D - commercialization continuum.

## 3.3 Policies and programs in the palm oil industry

Policy measures for palm oil are primarily aimed at increasing productivity and quality as well as expanding export markets. Three main institutions are involved to implement these policy objectives. They are the Palm Oil Registration and Licensing Authority (PORLA), the Palm Oil Research Institute of the Malaysia (PORIM) and the Malaysian Palm Oil Promotion Council (MPOPC).

PORLA's general function is to ensure the orderly development of the palm oil industry. PORLA issues licenses to those involved in the production, transportation, storage, export and sale of palm oil and its products. Generally, the regulatory activities of PORLA are for the quality control of palm oil and its products (Jailani and Malik 1995). All trade contracts are to be registered with PORLA, and traders are required to declare the quality of palm oil to be exported and ensure that the exported palm oil meets the quality specifications as declared in the contract.

The task of improving productivity, value-added, quality and all other aspects of the industry's output performance is PORIM's main function. PORIM undertakes all aspects of R&D in palm oil to enhance the performance of the industry. The main objectives of R&D activities in palm oil are to (i) increase production per unit area, (ii) reduce cost of production at all levels, (iii) improve quality of oil palm products and by-products, (iv) increase the value of oil palm and its products, (v) create a zero waste, environmentally-friendly and pollution free industry, and (vi) effectively transfer technical knowledge and provide advisory services to the industry (Jailani and Malik 1995).

MPOPC was established in 1990 to undertake public relations and market promotion of palm oil mainly in the export markets. It is run as a private company and promotes palm oil by organizing and participating in trade missions, exhibitions and distribution of information the nutritional aspects of palm oil. The organization also facilitates joint-venture programs. In promoting exports, PORIM is also engaged in providing technical support and information to increase consumer knowledge on palm oil and palm oil products through the Technical Advisory Services (TAS) whose activities are aimed at increasing the utilization of palm oil.

The activities of PORLA, PORIM and MPOPC are funded from a compulsory cess of

RM5 per ton for PORIM, RM1.75 per ton for PORLA and RM1 per ton for MPOPC. In addition, national R&D funds under Intensification of Research in Priority Areas (IRPA) are also available to researchers in PORIM.

Apart from the cess collected from the industry to finance R&D, promotion and regulatory activities, palm oil is also subject to export duties. During the early years, these duties aimed at providing revenue for the government. However, recently export duties for most palm oil products were abolished. Duties are only imposed on exports of CPO to encourage local processing of palm oil into higher value-added products. Exports of CPO are subjected to duty based on the government gazetted f.o.b. price of CPO. Table 3.6 shows the present export duty structure for CPO.

**Table 3.6 Export duty structure of crude palm oil.**

| CPO f.o.b. price | Export tax |
|---|---|
| On the first RM650 | Nil |
| Plus next RM50 | 10% |
| Plus next RM50 | 15% |
| Plus next RM50 | 20% |
| Plus next RM50 | 25% |
| Plus on the balance | 30% |

Source: Jailani and Malik 1995.

There are also incentives under the Promotion of Investment Act (PIA), 1986 and Income Tax Act 1967 (amended 1986) that can be utilized for selected palm oil industries, especially for export promotion activities. These include double deduction for export promotion and double deduction for export credit insurance. Export credit refinancing (ECR) is also available for palm oil exporters. In addition, exporters can seek the assistance of export credit insurance services through the Malaysian Export Credit Insurance Berhad. An Export Credit Insurance and Guarantee Scheme (ECIG) was launched in 1990 designed to protect commercial banks and financial institutions against non-payment of loans and advances made to exporters and importers. In the government's efforts to expand the palm oil market, especially to developing countries with low financial reserves, a Palm Oil Credit and Payment Agreement (POCPA) was introduced. The facility is for the maximum of US$100 million to cover the purchase of at least 50,000 tons of Malaysian palm oil per year for a period of three years.

## 3.4. Impacts of liberalization: a review of past studies

Since Malaysia is the largest exporter of palm oil in the world, any initiative that is aimed at liberalizing trade in palm oil and related products will have a positive effect on the Malaysian palm oil industry and the country as a whole. In general, tariff reductions and removal of quantitative restrictions as well as non-tariff barriers in countries that have demand or potential demand for vegetable oils for household or industrial consumption will be beneficial to the Malaysian palm oil industry.

GATT (1994) estimated that the percentage reduction in tariffs for oilseeds, fats and oils would amount to 40%. Poapangsakorn and Ungphakorn (1995) calculated that market access for vegetable oils through the 'minimum access opportunity' will increase by 110,000 tons between the base period and the end of the implementation period of WTO liberalization. This will certainly open up more opportunities for market penetration by palm oil. Apart from the gains that are to be obtained from increased exports, liberalization in oilseeds, fats and oil production is also expected to increase the price of these products. This is the result of reduction in subsidies at various levels of production. Brando and Martin (1993) predicted that the price of oilseeds would increase by almost 4% as a result of liberalization worldwide. In another study Goldin et al. (1993) also predicted an increase in the price of vegetable oils as a result of agricultural reform. They predicted a price increase of 4.1% for the commodity. Based on a 4% increase in price alone, Malaysia's export value of palm oil will immediately increase by almost RM50 million based on the value of 1997 palm oil exports.

Studies by local researchers are also in agreement that liberalization in the palm oil industry and markets will benefit the domestic industry. Mohamed Ariff et al. (1996) argued that the reduction of tariffs by U.S.A. by 19% for unprocessed and semi-processed products and 30% for processed products would benefit Malaysia, considering that the U.S.A. has been a traditional market for Malaysian palm oil. Likewise the reduction of tariffs on these products by Thailand and the Philippines will also offer increased market opportunities for Malaysian palm oil. This view is further supported by Tengku Ariff (1998) who predicted that the only sure winner for Malaysia from the UR and ASEAN agricultural liberalization initiatives is palm oil. In a more recent study, Mad Nasir et al. (1997) showed that trade liberalization will contribute to a 20.5% increase in the world exports of palm oil.

## 3.5 The effects of trade liberalization on the Malaysian palm oil industry

In this section, the effects of trade liberalization, particularly in terms of tariff reduction by major importers of Malaysian palm oil, are assessed. The evaluation will be on the effects of liberalization on domestic prices of both CPO and fresh fruit bunches (FFB), changes in consumer and producer surpluses and also export quantity.

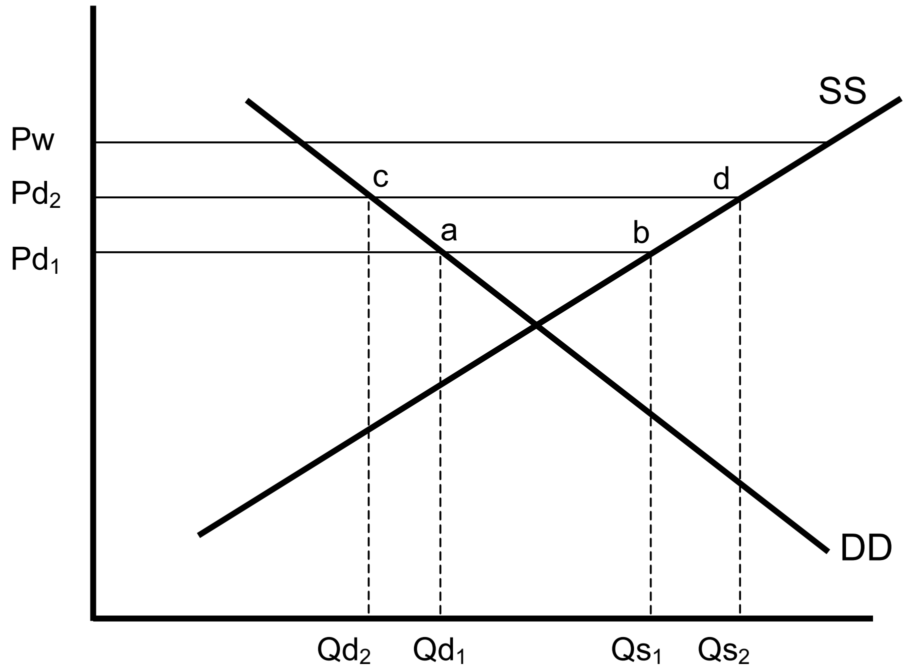
### 3.5.1 Conceptual framework

Figure 3.2 is a theoretical illustration of the effects of trade liberalization on production, consumption and trade of Malaysian palm oil.

Under current tariff conditions Malaysia produces $Qs_1$, and consumes $Qd_1$, of palm oil at price $Pd_1$. It exports ab quantity of palm oil. With a reduction in tariffs by importers of Malaysian palm oil, there will be a subsequent increase in demand of Malaysian palm oil in the international market leading to a shift in excess demand. The resulting increase in price in the international market as a result of the increased demand will be transmitted to the domestic market, causing the domestic price to increase from $Pd_1$, to $Pd_2$. At $Pd_2$, domestic consumption will reduce to $Qd_2$ while supply will increase to $Qs_2$. Exports of palm oil from Malaysia will now increase to cd. The difference in consumer surplus is the area $Pd_1$, $acPd_2$ and in producer surplus is $Pd_1$, $bdPd_2$.

To quantitatively evaluate the effects of tariffs on Malaysian palm oil, five functions are estimated viz. the domestic supply and demand functions, the export demand function and two price linkage equations. The equations are estimated using OLS. However, when evidence suggests that there are problems of autocorrelation, GLS estimates generated by the Cochrane-Orcutt procedure are used. The price linkage equations are to ascertain the relationship between world and domestic prices of palm oil and also the relationship between domestic CPO and FFB prices.

**Figure 3.2 Effects of tariff reduction on the domestic market of Malaysian palm oil.**




### 3.5.2 Impact on export demand of palm oil

Theoretically, the export demand for Malaysian palm oil depends on the price of palm oil in the international market, prices of palm oil substitutes, income and also tastes and preferences of consumers worldwide. Mohammed and Mohamad (1987) specified the export demand of Malaysian palm oil to be a function of palm oil price, export quantity lagged one year, time and the world industrial production index. In another study, Mad Nasir et al. (1994) specified export demand of palm oil to individual countries as a function of the price of palm oil in the world market, price of soybean oil as a substitute, the country's industrial production index, and exports lagged one year. Depending on the country, other substitute products used were groundnut oil and rapeseed oil.

In this study, the export demand for palm oil is hypothesized to be as follows:

XDPO = f (POPW, PSOY, WGNPI, TARIF, TREND)

where:

| | | |
|---|---|---|
| XDPO | = | export demand for Malaysian palm oil in CPO equivalent in tons |
| POPW | = | price of palm oil in the Europe market in RM/ton |
| PSOY | = | price of soybean in the Dutch market in US$/ton |
| WGNPI | = | Index of world GNP |
| TARIF | = | weighted tariff of 10 major importers of Malaysian palm oil in US$/ton |
| TREND | = | year |

Experimentation with the data showed high correlation among the independent variables resulting in multicollinearity. For simplicity of the empirical estimation, export demand of palm oil is defined as a function of its own price and the weighted import tariffs of the 10 major importing countries. These countries consisted of China, Egypt, EU, India, Japan, Pakistan, Singapore, S. Korea, Turky and US. A double-log functional form is used. The empirical results estimated are as follows:

$$LnXDPO = 18.054^{***} - 0.3297LnPOPW^{***} - 0.1315LnTARIFF \quad \text{(Equation 1)}$$
$$(63.93) \qquad (-3.29) \qquad (-1.278)$$

$R^2 = 0.963$; Adj.$R^2 = 0.958$; n = 17; F = 263.44***; D.W = 1.50

The t-values are given in parenthesis, with *** indicating significance at the 1% probability level.

The overall equation appeared to be satisfactory in explaining export demand in terms of goodness of fit as shown by the high $R^2$ and a prior expectations of the signs of the estimated coefficients. The estimated elasticity of own price, POPW, at 0.33 is within the range of estimated elasticities from previous studies. Mad Nasir et al. (1994) focused on six countries and estimated that their own price elasticities of export ranged from 0.13 to 0.63 for the six countries. However, Mohammed and Mohamad (1987) obtained a higher elasticity estimate of 0.75 when estimating export demand on an aggregate basis. However, all studies pointed to the fact that export demand is price inelastic, which is consistent with the findings of this study.

From the export demand function, the elasticity of the quantity of CPO exported from Malaysia with respect to tariff on Malaysian CPO is - 0.1315. This means that a 1% reduction in tariff will increase CPO exports by 0.1315%. Under a free trade environment where the tariff is zero, exports of Malaysian palm oil will increase by 1.973% (current weighted tariff of major importers = 15%). Using the 1996 data of exports of CPO equivalent of 7,587,855 tons, exports of CPO will increase by 149,708 tons under free market conditions.

### 3.5.3 Impact on domestic prices

The impacts of liberalization on domestic prices are estimated from two price linkage equations. The first equation links world price to domestic prices with the weighted tariffs influencing domestic prices, while the second equation simply links the CPO prices and FFB prices. The estimated price linkage equations are as follows:

$$PRCPODOM = 155.87^{**} + 0.9081PRCPOWR^{***} - 2.2479\,TARIF^{***} \quad \text{(Equation 2)}$$
$$(2.228) \qquad (16.099) \qquad (-3.222)$$

$R^2 = 0.973$; Adj. $R^2 = 0.968$; n = 17 (1980 - 1996) F = 132.6*** D.W = 1.72

The t - values are given in parenthesis, with ***, and ** indicating significance at the 1% and 5% probability levels, respectively.

$$PRFFB = 10.730 + 0.1968PRCPODOM^{***} \quad \text{(Equation 3)}$$
$$(5.667)$$

$R^2 = 0.916$; Adj. $R^2 = 0.910$; n = 16 (1980 - 1995); F = 32.111***; D.W = 1.69

where:

PRCPODOM = Domestic price of CPO in RM/ton
PRCPOWR = World price of CPO in RM/ton
PRFFB = Domestic price of FFB in RM/ton, and
all other variables are as previously defined.

From Equation 2, the elasticity of price transmission of domestic price of CPO with respect to the tariff calculated at the mean is - 0.2003%. This means that a 1% reduction in tariff will increase domestic prices by 0.2003%. With total liberalization, domestic prices will increase by 3.005%. Based on the 1996 domestic CPO price of RM1,191.5 per ton, the expected domestic price under a total trade liberalization scenario for palm oil will be RM1,227.30 per ton or a RM35 increase in price per ton.

In Equation 3, the elasticity of price transmission of the FFB price with respect to CPO calculated at the means is 1.0718 meaning that a 1% increase in price of CPO will also increase the price of FFB by 1.0718%. Since the CPO price is expected to increase by 3.005% under total liberalization, the FFB price to be received by farmers is expected to increase by 3.2159%. Based on the last five years average price of FFB, the FFB price under liberalization would be RM185.78 per ton or RM191.67 per ton based on the 1996 price of FFB.

### 3.5.4 Effects on domestic demand

Based on demand theory, the demand for palm oil in Malaysia is a function its own price, the price of substitutes and complementary products and income. For this study, the domestic demand for palm oil is specified as:

$$QCPO_t = f(PRCPO_t, GDP)$$

where

QCPO = per capita demand of CPO equivalent in tons/million population
PRCPO = price of CPO local delivered, deflated by the CPI in RM/ton
GDP = per capita real GDP in RM10,000

Estimation with GLS yielded the following estimation:

$$\underset{(0.7211)}{QCPO = 11434.00} - \underset{(-1.7261)}{8.6584PRCPO^{*}} + \underset{(2.278)}{0.2406GDP^{**}} \qquad \text{(Equation 4)}$$

$R^2 = 0.34$; Adj.$R^2 = 0.37$; $n = 21$; D.W = 2.0

The t-values are given in parenthesis, with **, and * indicating significance at the 5 and 10% probability levels, respectively.

The estimated model is not very satisfactory in terms of goodness of fit as indicated by the low $R^2$. Nevertheless, all signs are in accordance with a priori expectations. The low significance of the price variable and the importance of income as determinants of demand are consistent with findings of other studies (Mad Nasir et al. 1994; Mad Nasir et al. 1997). The own price elasticity estimated at the means is 0.45. This elasticity estimate is also within the range of estimates from previous studies (0.38 in Mad Nasiret al. 1997). In view of the consistency of the estimates with other studies, this model can be considered sustainable.

From the price linkage equation, linking domestic prices and tariffs, under a totally liberalized regime in palm oil trade in the international market, domestic CPO prices are expected to increase by 3.005%. With the demand elasticity estimate of 0.45, domestic demand is expected to fall by 1.352%. Based on 1996 consumption, demand will decrease by 10,504 tons. Consumer surplus will decrease as a result of the higher price and lower consumption. Total consumer welfare loss is estimated to be RM27.63 million.

### 3.5.5 Effects on domestic supply

The variables that can influence production of agricultural commodities are varied and many, depending on the type of commodity and the uniqueness of the production process. However, the core variables are usually own price and price of competing commodities. In many cases the level of technology, cost of production and also weather play important roles. Based on this supply theory, the supply of palm oil at the FFB level is specified as:

$$QFFB_t = f(PRFFB_{t-1}, PRRUB_t, TREND)$$

where:

QFFB = quantity of FFB in tons

PRFFB = annual average price of FFB in RM/ton
PRRUB = annual average price of rubber in RM/ton; and
TREND = year as a proxy for technology

Based on this specification, the FFB supply function is estimated as follows:

$$QFFB_t = -\ 4257723151 + 21833PRFFB_{t-1}^{***}$$
$$\qquad\qquad (-28.985) \qquad (3.177)$$
$$-\ 552.34PRRUB_t + 2153950YEAR^{***} \qquad \text{(Equation 5)}$$
$$\qquad\qquad (-0.711) \qquad (29.225)$$

$R^2 = 0.99$; Adj$R^2 = 0.98$; n = 15 (1981 - 1995); F = 294.327***; D.W = 2.60
The t-values are given in parenthesis, with ***, and* indicating significance at the 1 and 10% probability levels, respectively.

The above supply model performed extremely well both in terms of the goodness of fit and the significance of the variables. All variables except rubber price are significant at the 1% probability level. Technology, as indicated by the high significance of the YEAR variable, appeared to play a highly significant role in the production of FFB.

Based on the model, the supply elasticity computed at the means is 0.14 meaning that a 1% increase in price of FFB will increase FFB production by 0.14%. The FFB price, however, is expected to increase by 3.2159%. With the expected increase in FFB price, production will increase by 0.4502%. Based on 1996 production, supply will increase by 201,520 tons. The difference in producer surplus is estimated to be RM263.06 million.

From the above calculations the net gain from the effects of liberalization is about RM235.43 million. The analysis points to the fact that there are obvious welfare gains benefiting Malaysia resulting from liberalization of trade in palm oil in the world market. Although this analysis may suffer from data and model estimation constraints, it, nevertheless, provides a good indication of the expected direction of the impacts of liberalization. In addition, Malaysia’s benefit can be further expanded due to the requirement of other oilseed producers to reduce support to their industries, which is most likely to put upward pressure on prices of other edible oils such as soybean and corn oil. The higher prices of these products can result in a substitution effect that will be beneficial to palm oil. Furthermore, with liberalization, Malaysian palm oil can now enter new markets, which were previously closed and protected. Titapiwatanakun (1994), for example, estimated that the implementation of AFTA would increase imports of palm oil from Malaysia into Thailand by about 770 tons. Further in-roads are also expected in other ASEAN markets. Thus, the estimate of benefits to the industry by this study can be considered a conservative estimate.

## 3.6 Effects on specific location

The location chosen to study the potential micro effects of trade liberalization is a FELDA smallholder land scheme situated in Hulu Bernam, in the district of Hulu Selangor, Selangor. This land scheme is known as the ‘FELDA Gedangsa’. The population in Hulu Bernam was about 22,000 while the total population in the district of Hulu Selangor was about 78,000 (Population Census 1990).

### 3.6.1 Background of the smallholder land scheme

FELDA Gedangsa was initially established in 1961, starting as a rubber smallholder land scheme. As with other FELDA land schemes, this scheme was established to provide productive land to the landless poor so they could be gainfully employed in agriculture. This land re-settlement scheme is part of the government program to enhance the income of the rural populace.

The government provided the entire initial establishment and operating costs of the land scheme, which was centrally managed by FELDA. Settlers were chosen from all over the country and each family was given 3.54 hectares of land, including a simple house. Of the total, 3.44 hectares were for the agricultural holding and the remaining land was for the house. The government also provided all the necessary infrastructure to support the growth of the area.

The settlers initially worked as laborers paid sufficiently to take care of their needs. Over the years, when the holding matured and production began to bring income to the settler, the revenue was deducted to cover all the establishment, operating and management costs of the scheme. In the end, the land was given to the settler, although FELDA still managed the operation of the scheme.

### 3.6.2 FELDA Gedangsa today

Today FELDA Gedangsa has all the facilities required for a decent lifestyle including primary and secondary schools, kindergartens, playgrounds, public transportation, and health and telecommunication services.

Most of the rubber was replaced by oil palm. Total smallholdings under oil palm are now 1,843 hectares accommodating 536 families. Most of them are now elderly, considering that their average age was between 25 - 30 years when they first joined the scheme.

Only 20% of the second generation stayed on to continue farming or to assist the family in the production, while others obtained non-farm employment. FELDA continues to centrally manage the land scheme.

### 3.6.3 Cost and returns

The costs and returns of palm oil production for the FELDA Gedangsa smallholder land scheme on a per hectare basis can be seen in Table 3.7. The costs and returns are computed based in the last five years average, where the oil palm trees are already in their 12th year. The yield had stabilized for the last three years at about 22 tons FFB per hectare per year, similar to the national average yield of mature areas.

**Table 3.7 Cost and returns of palm oil per hectare per year, FELDA Gedangsa.**

| Item | Costs/Returns (RM) |
|---|---|
| **A. Variable costs** | |
| Fertilizer | 1,286.67 |
| Weed control | 85.20 |
| Pest and disease control | 38.80 |
| Roads and drains, maintenance | 219.87 |
| Others | 27.04 |
| Harvesting and transportation | 1,110.00 |
| Average variable cost | 2,767.58 |
| **B. Development** | |
| Fixed costs | 190.81 |
| Total costs | 2,958.39 |
| **C. Revenue** | |
| Yield of 22.4 tons FFB @ RM203.40/ton | 4,556.16 |
| Net Income | 1,597.77 |

Source: Survey data, 1999.

The net returns from palm oil production were RM1,597.77 per hectare per year. Considering that each family has about 3.5 hectares, the net returns per family were about RM5,600 per year. Their actual income is higher if they participate in farm operations such as in fertilization and harvesting, where they are paid wages. Thus, returns to labor are higher.

### 3.6.4 Liberalization effects

The effects of liberalization will be on revenue from the sale of FFB, since the price of FFB is expected to marginally increase by 3.216%. Other variable costs such as fertilizers and pesticides are not expected to change much, since current import taxes on most fertilizers and pesticides are already low, in the range of 0-5%. Based on the costs and returns shown in Table 3.7 and a yield of 22.4 tons of FFB per hectare, total gross revenue per hectare will increase to RM4,702.69. This represents a RM146.53 increase in revenue per hectare for the smallholder. Considering that all costs have been covered, this whole amount will contribute to the total net income. Hence, net income will increase to RM1,744.3 per hectare per year, representing an increase in net income of 9.1%. Taking into account that each family unit owns an average of about 3.5 hectares of holdings, total net income will increase to RM6,105.05 per year, an increase of about RM505. At the aggregate level for the whole scheme, which consists of 1,843 hectares of oil palm, total aggregate increase in net income would amount to RM270,055 per year. This amount would give a substantial boost to total aggregate spending in the area, which will in turn further enhance economic activity.

From the above simple analysis, it can be seen that what started as a marginal change in price can lead to substantial impacts at both macro and micro levels. Net welfare gains are substantial, while at the level of the farm, smallholders get to earn more by doing the same amount of work they currently do.

## 3.7 Policy implications and recommendations

The opening up of new markets and the relaxation of protection in existing traditional markets for palm oil for certain has and will present Malaysia with new economic and market opportunities. Malaysia should take advantage of the current market trends and capitalize on this opportunity. As the market for palm oil grows resulting from the increased demand and freer trade, many other new producers would likely surface to take advantage of the expanding market. This being the case, in the long term, Malaysia will see new competition in the marketplace that it now dominates. It must not be complacent, although the gains that can be achieved in the short run can be obtained by not doing anything. Continuous efforts have to be directed to maintaining and enhancing competitiveness of the industry. Efforts are also necessary to further promote the use of palm oil in competition against other edible oils. Some recommendations follow:

*Reducing labor requirements in the palm oil production processes.*

One of the current setbacks of the palm oil industry is the apparent lack of labor to support primary production of FFB. The industry is highly dependent on foreign labor for most of the operations in estates and to some extent in the smallholder sector. The requirement for mechanization and automation is pressing. Although at present, the government is practicing a relaxed labor policy, the industry cannot and must not in the long run allow itself to be forever dependent on foreign labor. As the regional economy grows and palm oil production also expands in neighboring countries, Malaysia may find itself in a position of that is highly deficient in both local and foreign labor for palm oil.

*Enhancing competitiveness*

Recent analyses showed that the competitiveness of the Malaysian palm oil industry is declining. Tengku Ariff (1998) showed that the ratio of Malaysia f.o.b. price of palm oil to the world price is increasing, although is still below one. Increased efforts to gain productivity, particularly in R&D, are required for the industry to stay ahead of competitors. New emerging palm oil exporting countries such as Indonesia, Papua New Guinea and Nigeria, which are considered low cost producers, can pose a serious threat to Malaysia.

Continuous competitiveness building and enhancing requires efficiency and quality improvements at all the four levels of palm oil production, viz. primary production, milling, refining and product manufacturing. With continuous efforts aimed at maintaining price and quality leadership for palm oil and palm oil products in the international market, Malaysia can look forward for more many years of substantial social and economic contribution from its 'golden crop'.

### *Product development and diversification*

The majority of exports of Malaysia palm oil products are still limited to secondary processed products. With increased liberalization, which is accompanied by decreasing tariff escalation on processed and manufactured products, especially in developed countries, there are increasing opportunities to export products that are of higher value added that would increase industry profits. Some of these products from palm oil include beta-carotene, vitamin E, cocoa butter equivalent and finished oleochemical products. Many of these sub-industries of palm oil in Malaysia are at the initial stages of development. Innovation and intensification of technological improvements in these sub-industries are constantly required for them to achieve excellence and world-class status.

### *Strengthening institutional support*

It cannot be denied that the phenomenal growth of the industry in Malaysia, which has evolved from just primary production and processing to a more diversified entity, is in part due to the strong institutional support that has been initiated and provided by the government. This includes the establishment of a dedicated research institute for the industry that was initially financed by the government, but now funded by research cess from the producers. Regulatory and promotional agencies like PORLA and MPOPC also played significant roles. With new agendas facing the palm oil industry, the institutional support needs constant review to make sure that the support that is in place such as incentives, credit financing and technical advisory and extension continues to provide services that are relevant to the industry.

### *Market diversification and deepening*

Liberalization also offers increased opportunities to diversify into non-traditional markets and deepen existing ones. Increased promotional campaigns to penetrate new markets will be required to introduce Malaysian palm oil, while market-positioning strategies are necessary to firmly maintain competitive market positions in traditional markets. In some of these aspects, there is room for cooperation among major palm oil exporters to act together in promotional activities in order to capture a large share of the edible oil market.

# 4. Paddy

## 4.1 Introduction

This chapter will quantify the effects of trade liberalization on the paddy subsector in Malaysia. As in the previous chapter a similar arrangement is adopted for the structure of this chapter. It begins with a description of the subsector and is followed by a section on policy interventions in the rice industry. Subsequently, a review based on past studies of the impacts of these interventions on the industry was undertaken. The next section deals with quantitative analyses for the specific effects on the commodity resulting from liberalization, including the effects on price, supply and demand as well as the welfare effects. In the last section, the effects were evaluated on producers in the MADA region, which is the location-specific study.

## 4.2 The paddy subsector

By any standard, Malaysia is a small rice producer. The total rice output in the country is estimated to be just 0.4% of total world output. Nevertheless, the sector has always been considered strategic and accorded special treatment by the government, mainly due to food security and socio-economic reasons. Malaysia feels that an acceptable level of self-sufficiency needs to be maintained for rice since if is a staple food. In addition, support to the sector is further justified to help enhance incomes of small farmers in the industry, many of whom are poor. Its strategic role in society has made rice one of the most important agricultural commodities in the country. Massive public investment in terms of infrastructural development and support services is made available to the industry. The subsector is also heavily supported by various subsidies including both price and fertilizer subsidies. In short, this subsector could be characterized as one that is subject to a high degree of market intervention compared to other agricultural commodities.

### 4.2.1 Economic and socio-economic contributions of the rice sector

In spite of all the initiatives taken for rice, its contribution to the national economy is still small and declining. In 1985, the contribution of the paddy sector was estimated to be 0.9% of GDP and 4.7% of agricultural value-added, but the contribution in 1995 was only 0.1% of GDP and 4.1% of agricultural value-added. The National Agricultural Plan (1998) forecasted that its contribution to agricultural value-added would continue to decline to 3.7% and 3.4% in 2005 and 2010, respectively. This situation was brought about by a decline in cultivated area, negligible gains in productivity, continued increase in the cost of production and decreasing profitability.

On the socio-economic front, however, rice cultivation is home to about 116,000 households, who depend on rice as a major source of income. This represents about 3% of the total households in the country (Jegathesan 1996a, b). Additionally, there are another 200,000 households that are engaged in rice farming as a secondary source of income. The breakdown of paddy farmers in the main rice growing areas in Malaysia and the average family size are shown in Table 4.1. Given that the average amount of labor utilized on the farm is small (at about 25 man-days per hectare per season), theoretically, there is substantial surplus labor within the farm household. Aging farmers with low level of education is one factor that prevents the movement of labor in the paddy sector to other sectors (Ariffin 1996).

**Table 4.1 Basic profile of paddy farmers in major rice growing areas, 1990.**

| Major Rice Areas | Number of Farm Households | Average Family Size |
|---|---|---|
| MADA | 63,000 | 5.2 |
| KADA | 45,000 | 6.6 |
| Kerian/Sg. Manik | 15,350 | 5.0 |
| North West Selangor | 14,600 | 6.0 |
| IADP P. Pinang | 47,500 | 5.5 |
| KETARA | 3,700 | 5.0 |

Source: Malaysian Agricultural Research and Development Institute (MARDI) 1990.

### 4.2.2 Area, yield and production

Paddy is produced almost entirely by smallholders. There are about 138,000 rice farmers in eight rice growing areas operating on about 212,000 hectares of rice field. This gives an average farm size of about 1.5 hectares per farm family. A study in MADA indicated that only about 15% of the farms in the area were of 3 hectares or more (Jegathesan 1996a, b). An earlier study, however, showed that only 3.8% of the farms in the area are of more than 3 hectares (Fatimah and Ghozali 1983). This increment is probably due to the consolidation of small farms into larger operating units, a development which is observed to be taking place in the main rice producing areas.

Land parcels identified as paddy land in 1995 total almost 600,000 ha, of which 63% is located in Peninsular Malaysia, 9% in Sabah and 28% in Sarawak (Table 4.2). However, the actual productive rice area is estimated at about 500,000 hectares (Jegathesan 1996a, b).

**Table 4.2 Distribution of paddy areas, 1995.**

| State | Irrigated Area (ha) | Non Irrigated Area (ha) | Total (ha) |
|---|---|---|---|
| Perlis | 116,148 | 3,648 | 25,990 |
| Kedah | | 2,485 | 118,663 |
| P. Pinang | 14,920 | 225 | 15,145 |
| Perak | 46,916 | 4,255 | 51,171 |
| Selangor | 19,144 | 106 | 19,250 |
| Megeri Sembilan | 8,400 | 1,449 | 9,849 |
| Melaka | 5,959 | 3,435 | 9,374 |
| Johor | 3,027 | 746 | 3,773 |
| Pahang | 15,701 | 13,796 | 29,497 |
| Terengganu | 15,897 | 12,173 | 28,070 |
| Kelantan | 41,152 | 25,382 | 66,534 |
| Sub total (Peninsular) | 287,244 | 90,072 | 377,316 |
| Sabah | 17,163 | 33,639 | 50,802 |
| Sarawak | 15,136 | 153,076 | 168,212 |
| Total (Malaysia) | 3,119,543 | 276,787 | 596,330 |

Source: Department of Agriculture 1996.

A more meaningful indicator of land utilization for rice cultivation is planted area. This takes into consideration the actual area of land under rice cultivation for each season. The actual planted area would be the summation of the two seasons (if double cropping is practiced), and it depends on the cropping intensity of a particular rice growing area. Based on this definition, total area under rice cultivation in 1995 was about 673,000 hectares, 74% of which was in Peninsular Malaysia.

An analysis of the changes in cropped area, production and yield between 1985-1995 is shown in Table 4.3. During this period, there was almost a 22% increase in paddy production, from 1.7 million tons to 2.1 million tons, representing a growth rate of 2% per annum. During the same period, there was only a marginal increase in paddy cultivated area, with a marginal annual growth of 0.3%. Undoubtedly, this increase in production was brought about by yield improvement, which registered a 1.7% growth per annum during the same period. It should also be noted that the growth in Peninsular Malaysia was brought about by an overall increase in the performance of the eight main rice-producing areas. Other areas outside the main granary registered negative growth rates in terms of cultivated area, production and yield. This was due to the closure of a number of secondary and minor irrigation schemes, a reduction in rainfed paddy cultivation areas and a marginal decline in productivity for areas outside the main granary. A higher growth rate was registered for Sabah, while Sarawak registered negative growth.

In Peninsular Malaysia, rice production is concentrated mainly in the eight designated rice-producing areas, also known as the main granaries. These areas are actually major irrigation schemes, which together account for 77% of total cultivated area for rice and 83% of total paddy production in Peninsular Malaysia (Table 4.4). Over the 1985-1995 period, these eight granary areas have increasingly contributed to national paddy production from 64.3% in 1985 to almost 72% in 1995 (Table 4.3). Yields, however, vary substantially between granary areas. During this period, increases in cultivated area, production as well as productivity were also observed. The increase was the result of yield improvement, increased cropping intensity and better farm management practices. Productivity growth of between 0.9% and 4.9% per annum for each granary was registered during the period.

Paddy is also grown in the 'secondary or mini granary areas', which are supported by small and medium scale irrigation facilities with varying degrees of double cropping capabilities. Currently, there are 74 secondary granaries and 172 minor granaries in operation, with total paddy area of 28,441 and 47,653 hectares, respectively. Eighty percent of these areas are located in the Peninsular Malaysia. Together with the main granary, they constitute about 85% of total paddy cultivated area.

The balance of another 15% of planted area represents the non-irrigated rice areas, which include rainfed paddy fields and hill or upland paddy, which are mainly concentrated in Sabah and Sarawak. In these areas, single-cropped paddy cultivation is widely practiced (including shifting cultivation) with little or no inputs. Productivity is low, ranging between 0.7 ton/ha in Sarawak to 1.8 ton/ha in Sabah. A summary of the distribution of paddy areas is depicted in Table 4.4.

### 4.2.3 Consumption and self-sufficiency level (SSL)

Since independence, various development policies and strategies for production, consumption and trading of paddy and rice have been formulated. The outcome of these measures was a fairly remarkable increase in production resulting in an achievement of a SSL of 78.5% in 1995, compared to 54% in 1965. For the period 1970-1995, the average SSL was 77.7%, which ranged between a low of 61% in 1978 and an all time high of almost 84% in 1986 (Table 4.5). Considering the current policy of ensuring a minimum SSL of 65%, the country was quite successful in achieving its food security objectives in rice.

The period of 1970-1995 also saw a declining trend in per capita consumption of rice. Per capita consumption declined from 134 kg to 86.9 kg during the period, a decline of 1.7% per annum. The 1994 household expenditure survey showed that rice constituted about 10.5% of the total food household expenditure, compared fresh fish (19.5%), fresh meat (15.1%), vegetables and fruits (21.5%) and milk and eggs (8.9%).

**Table 4.3 Planted area, production and yield of paddy, Malaysia, 1985-1995.**

| Region | 1985 | | | 1990 | | | 1995 | | | Annual Growth (%) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Planted Area ('000 ha) | Production ('000 tons) | Yield (tons/ha) | Planted Area ('000 ha) | Production ('000 tons) | Yield (tons/ha) | Planted Area ('000 ha) | Production ('000tons) | Yield (ton/ha) | Planted Area ('000 ha) | Production ('000tons) | Yield (tons/ha) |
| Peninsular Malaysia | | | | | | | | | | | | |
| Main granaries | 336.8 | 1,122.4 | 3.33 | 373.6 | 1,297.9 | 3.47 | 383.1 | 1,527.7 | 3.99 | 1.3 | 3.1 | 1.8 |
| • MADA | 186.1 | 701.0 | 3.77 | 189.7 | 724.9 | 3.82 | 193.8 | 862.2 | 4.45 | 0.4 | 2.1 | 1.7 |
| • KADA | 37.9 | 108.2 | 2.85 | 46.3 | 163.7 | 3.54 | 51.7 | 181.2 | 3.50 | 3.1 | 5.2 | 2.1 |
| • Kerian/ Sg. Manik | 47.2 | 144.1 | 3.05 | 51.1 | 128.7 | 2.51 | 48.6 | 163.0 | 3.35 | 0.3 | 1.2 | 0.9 |
| • North West | 34.2 | 97.4 | 2.85 | 35.7 | 142.0 | 3.98 | 35.6 | 146.7 | 4.12 | 0.4 | 4.1 | 3.6 |
| • IADP, P. Pinang | 16.0 | 31.7 | 1.98 | 21.8 | 35.9 | 1.65 | 19.3 | 62.7 | 3.25 | 1.9 | 6.8 | 4.9 |
| • Seb. Perak | 9.4 | 20.5 | 2.18 | 17.1 | 70.5 | 4.12 | 17.1 | 56.9 | 3.33 | 5.9 | 10.2 | 4.2 |
| • KETARA | 6.0 | 19.5 | 3.25 | 8.0 | 25.5 | 3.19 | 9.5 | 35.3 | 3.71 | 4.6 | 5.9 | 1.9 |
| • Kemasin/ Semerak | - | - | - | 39 | 6.5 | 1.67 | 7.5 | 19.7 | 2.63 | - | - | - |
| The rest | 118.9 | 332.4 | 2.80 | 120.4 | 326.9 | 2.72 | 113.4 | 310.6 | 2.74 | -0.5 | -0.7 | -0.2 |
| Sub total | 455.7 | 1,454.6 | 3.13 | 494.0 | 1,624.6 | 3.29 | 496.5 | 1,838.3 | 3.70 | 0.8 | 2.3 | 1.5 |
| Sabah | 38.0 | 79.1 | 2.08 | 54.8 | 94.8 | 1.73 | 53.1 | 143.5 | 2.70 | 3.3 | 5.9 | 2.6 |
| Sarawak | 161.2 | 211.7 | 1.31 | 131.8 | 165.6 | 1.26 | 123.1 | 145.4 | 1.18 | -2.7 | -3.7 | -1.0 |
| Malaysia | 654.9 | 1,745.4 | 2.67 | 680.6 | 1,885.0 | 2.77 | 672.7 | 2,127.2 | 3.16 | 0.26 | 1.97 | 1.68 |

Source: Paddy Statistics (various issues).

**Table 4.4 Distribution of irrigated rice area by classification, Malaysia, 1995.**

| | Classification | Gross Rice Area | |
|---|---|---|---|
| | | (ha) | (%) |
| **A.** | **Major granaries** (8 irrigation schemes) | | |
| | 1. MADA | 97,000 | |
| | 2. KADA | 31,477 | |
| | 3. Kerian – Sg. Manik | 30,058 | |
| | 4. N. W. Selangor | 19,022 | |
| | 5. Penang | 13,000 | |
| | 6. Seberang Perak | 9,510 | |
| | 7. Kemasin Semarak | 7,330 | |
| | 8. Besut | 5,100 | |
| | Total | 212,497 | 62% |
| **B.** | **Secondary granaries** (74 irrigated schemes) | 28,441 | 8% |
| **C.** | **Minor granaries** (172 irrigated schemes) | 47,653 | 14% |
| **D.** | **Non-granary areas** | 54,028 | 16% |
| Total irrigated rice area | | 342,619 | 100% |

Source: Jegathesan 1996.

**Table 4.5 Rice production, consumption and self-sufficiency levels (SSL) in Malaysia, 1970-1995.**

| Year | Rice Production ('000 tons) | Capita Consumption (kg) | Population (million) | Total Consumption ('000 tons) | SSL (%) |
|---|---|---|---|---|---|
| 1970 | 929 | 134 | 8.9 | 1,195 | 77.7 |
| 1975 | 1,099 | 118 | 11.9 | 1,404 | 78.2 |
| 1980 | 1,145 | 105 | 13.7 | 1,439 | 79.6 |
| 1985 | 1,189 | 103 | 15.68 | 1,615 | 73.6 |
| 1990 | 1,215 | 87 | 17.76 | 1,545 | 78.6 |
| 1995 | 1,373 | 86.9 | 20.11 | 1,748 | 78.5 |

Source: Department of Agriculture: various issues.

Malaysia still imports rice in amounts ranging from 85,000 tons in 1975 to almost 580,000 tons in 1996 to fulfill its total requirement. Current major suppliers are Viet Nam and Thailand. The total import value for 1995 was RM356 million. This constituted about 4.5% of the total food import bill, declining from a high of 15% 30 years ago (Table 4.6). The more recent figures indicate an estimated increase in import value to the tune of RM800 million due to an increase in world paddy price, declining domestic production and the weakening of the Malaysian ringgit against the US dollar (Ariffin 1998).

**Table 4.6 Value of food imports and total exports (RM million), 1965-1995.**

| Year | Gross Food Imports | Rice Imports | Rice as % of Total Food |
|---|---|---|---|
| 1965 | 749.6 | 112.6 | 15.0 |
| 1970 | 786.7 | 95.5 | 12.1 |
| 1975 | 1,401.5 | 148.0 | 10.6 |
| 1980 | 2,444.3 | 140.5 | 5.7 |
| 1985 | 3,075.4 | 237.8 | 7.7 |
| 1990 | 4,551.3 | 269.8 | 5.9 |
| 1995 | 7,887.7 | 356.1 | 4.5 |

Sources: Ministry of Agriculture: various issues.

### 4.2.4 Rice marketing and distribution

Rice marketing channels and distribution are very well defined and quite straightforward. Paddy farmers sell their harvested paddy directly to private rice mills or through paddy buyers (Figure 4.1). There are a total of 352 active rice mills in the country concentrated mainly in the granaries. Locally milled rice is sold to some 1,268 licensed rice wholesalers for distribution to about 37,000 licensed rice retailers (Mohd. Ibrahim and Wong 1998).

The most important agency regulating paddy and rice marketing is BERNAS (Padi Beras Nasional Berhad). This was formerly the Lembaga Padi dan Beras Negara (National Rice and Paddy Board or LPN), which was established in 1971 to guide and regulate development of the rice industry. The agency was later incorporates in 1994 and later privatized in 1996. The privatized BERNAS now controls almost all aspects of rice trade, including the normal commercial activities of paddy procurement, rice milling and trading. It also includes trading, as well as other non-commercial activities on behalf of the government, namely management of the national rice stockpile, the disbursement of paddy subsidy payments and procurement of paddy from farmers as the buyer of last resort. It is in recognition of these non-commercial activities that BERNAS has been given the exclusive right to import rice into the country for a period of 15 years following the signing of the privatization agreement (Mohd. Ibrahim and Wong 1998). The amount to be imported is based on the shortfall between total rice requirement and domestic production, as well as to fulfill the rice stockpile requirement. The regulatory functions and activities are now placed under the jurisdiction of the Ministry of Agriculture. At the moment, BERNAS is involved in the supply of certified seeds, rice farming, rice milling and warehousing (50% of market share), wholesaling (12% of market share), and retailing (18% of market share).

### 4.2.5 Cost of production

Compared to many other rice-producing countries, Malaysia's cost of rice production can be considered high. The average cost of production for the eight granary areas is depicted in Table 4.7. It ranges from RM954 per ha in KADA to as high as RM2,028 in Northwest Selangor. The average cost of production for Peninsular Malaysia is RM600 to RM1,500 per hectare, and the cost to produce one kilogram of paddy ranges between RM0.28 and RM0.40 (Table 4.7 and Table 4.8). The major components of the cost are land preparation, harvesting and land rental. Together, they constitute about 52% of the total cost of production. The cost of production for owner-operators with a farm size of 1 ha or less can be as low as RM600 per hectare whilst that of tenant farmers can be as high as RMl,500/ha. As a high cost producer, Malaysia is certainly not a competitive producer, especially when the world rice price is low. This problem is further aggravated by the continued increase in the prices of inputs including labor wages, land rent and agricultural inputs.

Paddy cultivation at this moment is still a low-income economic activity in the country and rice is considered 'a poor-man's crop'. The unattractiveness of rice cultivation is further compounded by a number of inherent problems faced by the paddy subsector. Small-scale paddy production units, low and unattractive returns, a relatively low average yield and a highly regulated market are some of the weaknesses faced by the subsector. There are now efforts by the private sector to increase productivity and efficiency through large-scale estate-type production systems. While these efforts have shown some success, the transformation of the subsector into a larger scale by this approach is not expected to be extensive in the short and medium term. High infrastructural costs, resource availability (especially land) and other socio-economic problems especially with regard to issues on consolidation of existing paddy field into larger holdings are some of the constraints. Furthermore, under current policy, both the fertilizer and price subsidies are limited to smallholders with holdings of less than 2.4 hectares. This restriction discourages consolidation of holdings into larger scale operating units.

**Figure 4.1 Rice marketing and distribution chain.**

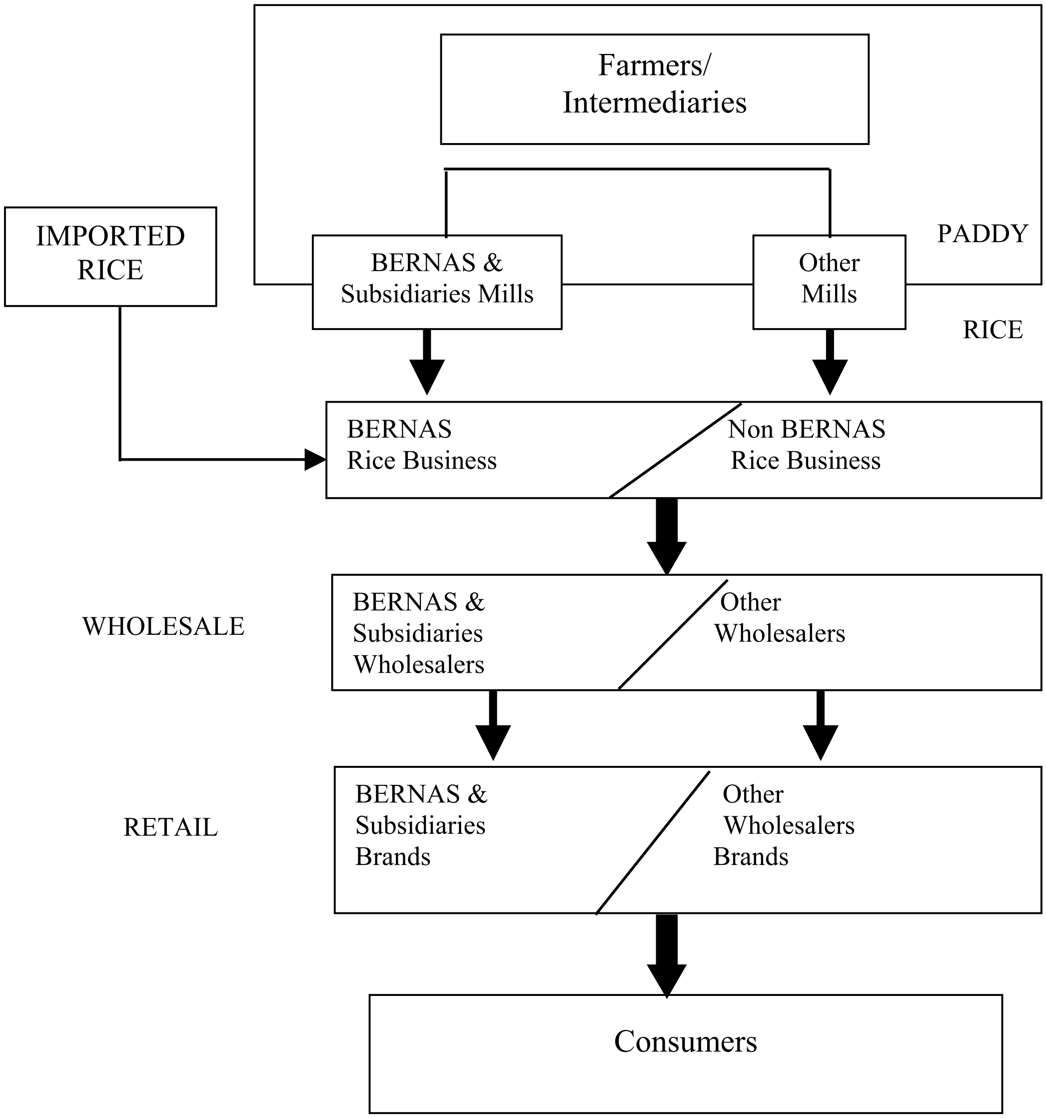


**Table 4.7 Average paddy production cost, Malaysia, 1993.**

| Production Item | Owner Operated, Normal Input Cost (RM/ha) | Tenant Operated, High Input Cost (RM/ha) |
|---|---|---|
| Land preparation | 150 | 200 |
| Additional land preparation | - | 50 |
| Seeds | 90 | 120 |
| Fertilizer MR600/ton | (180)[1] | (180)[1] |
| Additional fertilizer | 30[2] | 80 |
| Herbicides | 75 | 150 |
| Pesticides | 30 | 75 |
| Harvest | 200 | 250 |
| Labor | (200)[3] | 200 |
| Land rental | - | 325 |
| Total | 955 | 1,630 |
| Total (less fertilizer) | 775 | 1,450 |
| Total (less fertilizer and labor) | 575 | - |
| Approximate total (with contingencies) | 600 | 1,500 |

Source: MARDI (unpublished).
Notes: 1. fertilizer subsidy
2. optional
3. return to family labor

**Table 4.8 Average cost of paddy production in granary areas, 1993.**

| Granary Area | Cost of Paddy (RM/ha) | Cost of Paddy (RM/kg) |
|---|---|---|
| 1. MADA | 1,079.69 | 0.30 |
| 2. KADA | 954.02 | 0.28 |
| 3. P. Pinang | 1,176.51 | 0.40 |
| 4. Kerian/Sg. Manik | 1,069.50 | 0.33 |
| 5. Northwest Selangor | 2,028.00 | 0.45 |
| 6. Kemasin Semarak | 1,208.70 | 0.40 |
| 7. Besut | 1,355.00 | 0.40 |
| 8. Seberang Perak | 1,369.00 | 0.39 |

Source: MARDI (unpublished).

It is claimed that the continued capability of the country to sustain paddy production is mainly due to the generous price and income support provided by the government to the subsector to sustain profitability and producer incomes. In line with the government's commitment to the World Trade Organization (WTO), which calls for the phasing out of all direct price support, support measures will have to be repackaged and the industry as a whole will have to be rationalized.

## 4.3 Policy measures in the paddy and rice industry

The World Bank report on Malaysia incentive policies in agriculture provided a comprehensive list of policy measures particularly in relation to incentive policies for all agricultural commodities (World Bank 1984). Specifically for the rice industry, another review was conducted by the World Bank (1988) which also measures the impact of various interventions on production, consumption, and income. The study by Fatimah and Ghazali (1990) provides another excellent review on the evolution of various market interventions in the paddy and rice industry. Supplemented by information on more recent developments, Tengku Ariff (1998) completed the history up to the present time. A summary of major intervention policies for the paddy and rice sub-sector is given in Table 4.9. It indicates the extent of intervention and the objectives. The subsequent sections will now focus on incentive policies related to the price support programs and input subsidies, which represent the two major programs in the paddy and rice industry.

### 4.3.1 Fertilizer subsidy

The fertilizer subsidy scheme was first introduced in the early 1950s with the objective of encouraging farmers to use fertilizer, hence demonstrating the higher pay-off from using adequate fertilizer, both in terms of paddy output and income. The amount was based on the actual requirement, which differed between regions. While this was supposed to be a temporary measure, it was continued at 30% of the original level until 1971. Since these were only limited subsidies, the program was terminated when fertilizer prices became cheaper. However, this changed when imported fertilizer prices again increased. This prompted a re-introduction of a more comprehensive fertilizer subsidy program in 1979, which was later turned into a 100% subsidy. This subsidy, however, is given only to the landowners and not operators. The total value of the subsidy amounted to about RM231 per hectare or 33% of the cost of production per hectare (Chamhuri 1985). This has decreased to the current average value of RM144 per hectare, an equivalent of 15% of the total cost of production, due to cheaper fertilizer costs and an increase in cost of other production factors (Jegathesan 1996a, b). The total cost to the government to support the program for the period 1980 to 1986 was RM473 million (World Bank 1988). Under this program, The National Association of Farmers Association (NAFAS) was given a monopoly to distribute the fertilizer and was given about RM42 million during the 1980-1986 period to cover distribution costs. The total number of farmer recipients varied from a high of 416,000 in 1980 to a low of about 280,000 in 1985. In 1997, the allocation for fertilizer subsidy was further increased by another RM22 million, prompted by requests from farmers, in view of the rising costs of production and depreciation of the Malaysian ringgit.

### 4.3.2 Price support

The program is in the form of a guaranteed minimum price (GMP) and price subsidy. The GMP was first introduced after Malaysia gained her independence in 1957 out of concern for the lagging income among paddy growers. Under the program, a certain floor price level was imposed, which was RM15 per picul (equivalent to RM250 per ton). The program, however, failed to enhance income of paddy farmers and reduce poverty. This was due to the inability of the program to continue supporting the income of producers, while at the same time protecting consumers from rice price increases. Subsequently, the government in the 1970s undertook a more direct measure by taking control of the price of rice. This was done by creating a specific agency, the LPN, to participate in paddy processing and marketing. The introduction of price controls ensured fair rice prices to consumers, whilst its involvement in paddy purchasing, processing and marketing improved competition in the market by controlling margins of middlemen. By 1974, the GMP for long-grain varieties was set at RM429.9 per ton. This was later raised to RM496 per ton for long grade paddy and RM433 per ton for medium grade in 1979 (World Bank 1988). Fair prices for both producers and consumers were realized then. The last revision took place in 1997, when the rate was further increased to RM55 per 100 kg and RM51.69 per 100 kg for long and medium grade, respectively. This increase, however, was borne by millers at zero cost to the government.

The price subsidy (bonus) was first introduced in the early 1980s whereby paddy farmers were given a subsidy of RM2 per picul (RM33 per ton) for every picul sold. This was revised in 1982, when the rate was increased to RM10 per picul (equivalent to RM167 per ton). This represented an increased of 80%. The final revision was in 1990 to the current level of RM248 per ton.

**Table 4.9 Summary of major policy interventions and their objectives in the paddy and rice industry.**

| Policy Instruments | Objectives of the Intervention |
|---|---|
| **A. Input intervention** | |
| • Fertilizer subsidies | To encourage farmers to use fertilizer in the earlier years, reduced cost of production, increased income. |
| • Credit facilities | To finance double cropping of paddy and purchase of inputs. The interest rate was raised from 0% to 4% in 1986. |
| • Irrigation investment | To realize the double cropping goal, hence increase in production and income. It involves huge capital investment totaling RM4.2 billion during the period 1956-1996 (14% of total allocation for agricultural development); water charges are either negligible or free. |
| **B. Paddy Marketing and processing** | |
| • Floor price in the form of guaranteed minimum price (GMP) | Income support program by supporting paddy prices. Current price is RM55 and RM51.69 per 100 kg of long and medium grade paddy, respectively. |
| • Price subsidy (bonus payment) | Income support program, to the amount of RM248 per ton. |
| **C. Rice Marketing and Pricing** | |
| • Rice marketing | Monopoly by BERNAS in rice trading to ensure fair price to both producers and consumers. |
| • Rice pricing | Consumer protection, based on cost-plus pricing, the price is set by the government. |

Source: World Bank 1988.

Despite increasing intervention over the years, the government is trying hard to liberalize the industry albeit on a gradual basis. Under the previous scheme, all grades of rice were controlled at all levels including millers, wholesalers and retailers. At the retail level, there were thirteen grades of rice (based on different specifications) including one grade each for glutinous and parboiled rice. The prices varied depending on grade and location (six geographical locations). Considering also the different prices at the wholesaler and miller levels, the total number of prices to maintain was 156. Under the restructuring program, the grades of rice are now reduced to only three grades, viz. standard, premium and super. The government now only controls the price of the standard and premium grades, the grades that are mostly consumed by the lower income group. The price of the super grade is now floated and subjected to market forces. The retail price of standard rice is now set at RM89 to RM99 per 100 kg and RM96 to RM106 per 100 kg for premium grade rice, based on different geographical locations. Retail prices for super grade vary according to the percentage of broken rice, ranging from RM157 to RM169 per 100 kg. The margin at retail is also fixed.

## 4.4 Impact of policy intervention - a review

In 1995, the Agriculture Agreement of the Uruguay Round was set to change the future scenario of world agricultural trade. The Agreement covers market access, which focuses on increasing trade, while the focus on controlling domestic support and export subsidies is aimed at redeeming serious distortions to the world market. According to the terms of the Agreement, Malaysia satisfies the requirement on market access for rice, but violates the domestic support clause, because it provides direct price support to rice producers. Hence, the objective of providing price support to increase the income of rice farmers as well as to increase productivity cannot be pursued in the future. This is expected to create significant impacts on the industry.

A number of studies have been conducted to measure impacts of some or all of the policy interventions within the paddy and rice industry. The immediate impact from the withdrawal of these interventions, especially with regard to price and input subsidy, would be a shift in financial burden by the government to the farmers, millers, and traders, and its influence on production and self-sufficiency levels. Without government intervention, entirely different outcomes than what is realized now could be expected.

A review by World Bank and the Government of Malaysia (1988) on the rice industry was prompted by failure of the paddy and rice sector to respond to generous subsidies and public investment in irrigation schemes. By analyzing nominal protection coefficients, it was found that domestic paddy production began to register high nominal protection rates with the introduction of the paddy bonus scheme in 1981. Subsequently, there was a steady increase in the nominal protection coefficient from 0.97 in 1981 to 2.07 in 1986. This means that the producer price was about twice the imported parity price. An assessment of the impact on farm income concluded that the guaranteed minimum price increases price stability, but decreases the stability of farm income by preventing price increments in poor seasons. As a result of these interventions, it is estimated that 74% of the monthly income from paddy was derived from these income support measures. In short, the report indicated that in its present form the Malaysian rice industry is a non-viable and non-sustainable subsector. Production and productivity are falling, budget costs are rising, consumers pay a higher price, and the poorest farmers benefit least from subsidies.

Fatimah and Mohd Ghazali (1990) utilized a benefit and cost ratio (B/C ratio) approach in determining the impact of both fertilizer and price subsidies. They found out that the B/C ratio of the fertilizer subsidy is well below 1 (between 0.31 to 0.43) for the major rice producing areas. In fact, Kedah/Perlis region where MADA is sited registered the lowest ratio at 0.31. This implied that the actual cost of fertilizer and delivery to farmers far exceeded any benefits derived. For Peninsular Malaysia, the total benefit was only 45% of the total cost incurred in the implementation of the fertilizer subsidy scheme. Similarly, the cost of implementation for the price support program was higher than the benefit derived from it. The total benefit was only 67% of total cost. At the producer level, under optimum utilization of inputs, the fertilizer subsidy resulted in an increase in fertilizer application. Consequently, there was a corresponding increase in output, and hence profitability and income. It was also found that increased fertilizer application contributed more to profit than to output increment. A 1% increase in fertilizer application resulted in a 1.5% increased in yield, which is translated into a 12% increase in profits.

The study also indicated that the fertilizer subsidy had a larger impact on production compared to price subsidy, by increasing the output level by 65.8%, compared to only 34.2% from the price support scheme. On the other hand, the price support scheme resulted in a greater change in income level (71.5%) compared to the fertilizer subsidy scheme, which registered only 38.6%. An earlier study conducted by Fatimah and Ghazali (1983) indicated that the price subsidy failed to reach the targeted group, in this case the poor farmers, since the bulk of the output was used for home consumption.

The normalized restricted profit function approach was also utilized in assessing the impact of the fertilizer subsidy on economic efficiency of paddy farmers. By this methodology, Zaleha and Mohd. Arif (1986) concluded that the subsidy was scale-neutral and did not contribute significantly to economic efficiency (both technical and price efficiency) between small and large farms. The implication for this would be that the consolidation of small farms into bigger holdings under the then existing technology might not be successful in increasing farm productivity.

By using supply-demand analysis, Nik Fuad (1993) was able to measure impacts in terms of benefits and costs to producers, consumers and the government. To some extent, the results of the analysis conformed with the findings made by the World Bank (1988), especially with regard to increased production, increased budget requirement for input and price support programs and uneven distribution of benefits between small and large farmers. The price elasticity for major rice growing areas was found to be relatively low compared to other rice growing areas. The long run price elasticity was 0.23, and for the short run 0.25. The inelasticity of supply especially in major granary areas means that any price change would not produce a significant impact on rice supply.

Tan (1987) made another interesting observation. By using the standard calculations of nominal protection coefficient (NPC), effective protection coefficient (EPO) and domestic resource cost (DRC), the study measured the level of price distortions. In the earlier years (1979-81), the NPC ranged from 0.9 to 1.1. From 1984 to 1986, the NPC increased to between 2.20 and 2.39, indicating that the domestic rice industry was protected by more than double the world price. In terms of EPO, the value increased from 1.09 in 1981 to 4.63 in 1985, which means that the country subsidized its rice production by more than four times its economic value. During the same period, DRC increased from less than 1.00 in 1981 to 2.02 to 1985. This reflects a comparative advantage in rice production in the face of falling world prices. Nevertheless, impacts on farmers' returns (and poverty status) were very obvious. In 1985, with full subsidy, owner-operators in MADA were able to achieve an annual income of RM5,128 of which 61% represented the subsidy components. Ten years later, the average annual income of rice farmers in MADA stood at RM8,616, while another RM2,100 were derived from other off and non-farm activities (Ariffin 1996). The significant gain from farm income is due to larger farm size averaging 1.99 hectares and higher yield level (4.6 ton/ha).

Distribution-wise, since subsidy is paid according to the volume of production (price support) and farm size (fertilizer subsidy), larger farms (with larger output normally) will gain more from the subsidy scheme. Since 82% of paddy farmers operate a farm size of 1.4 hectares and below, it is not difficult to visualize where the bulk of the subsidies were distributed. This confirms previous findings that the distribution of benefits would worsen the income disparity between groups under different endowments, in this case the farm size.

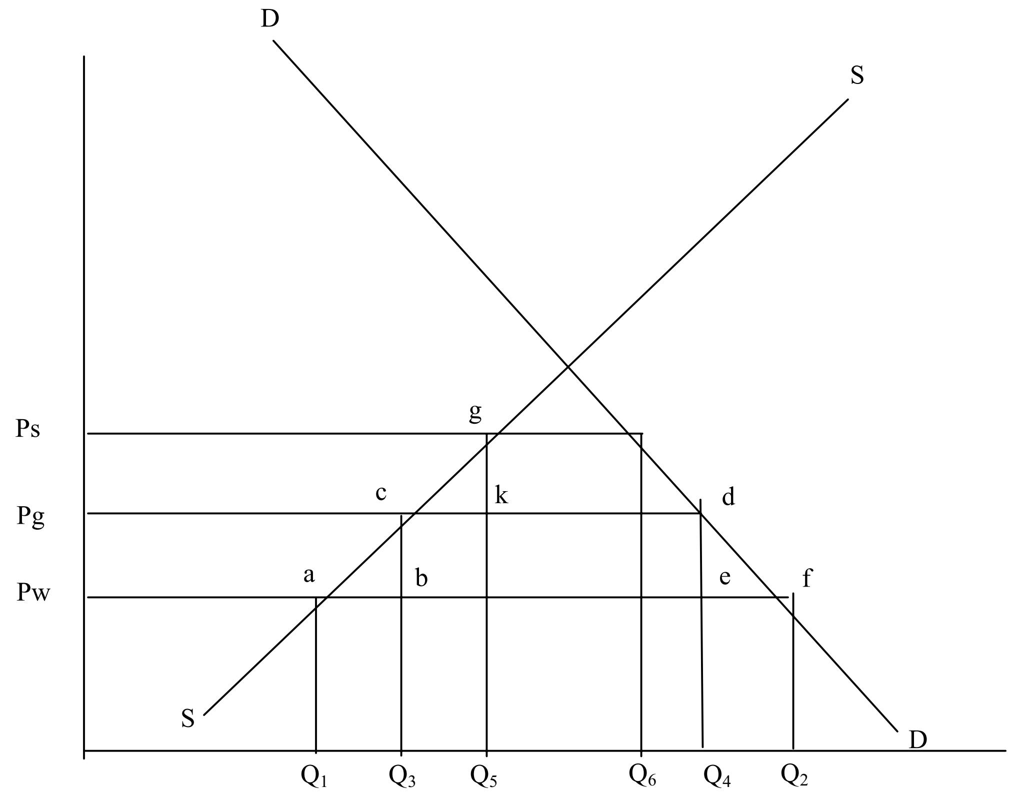
## 4.5 Commodity-related effects of liberalization

This section quantitatively evaluates the impacts of trade liberalization in the rice sector with respect to prices, producer and consumer surpluses and losses as well as the effects on trade in rice. It begins with a description of the theoretical framework followed by an assessment of the impacts. For this purpose, two price linkage equations are used linking import price of rice and effective rate of protection (tariff equivalent) to the domestic retail price, and the other linking retail price and farm price. A supply equation was also estimated to obtain supply elasticity, while the demand equation was obtained from a previous study.

### 4.5.1 Conceptual framework

The conceptual framework is shown in Figure 4.2.

**Figure 4.2 Price subsidy and intervention in the rice sector.**




In the figure, $P_w$ represents the world price, which most of the time is lower than the price in domestic market. At this price, the country produce $Q_1$ quantity of rice while the demand is at $Q_2$. The gap between $Q_2$ and $Q_1$ is met through imports, at the cost of $(Q_2 - Q_1) P_w$. When the government intervenes and introduces the GMP at $P_g$, rice production increases to $Q_3$ while consumption declines to $Q_4$. The impact will be a loss in consumer surplus, denoted by the area $P_w$ $P_g$ df. This loss is partly compensated by a gain in producer surplus to $P_w$ $P_g$ ca and in import revenue represented by the area bcde. The area abc represents the production efficiency loss and the area def as consumption dead weight loss. Import decreases to $(Q_4 - Q_3)$. The introduction of price subsidy on top of the GMP resulted in increment in producer price to Ps, and production increases to $Q_5$. However, since the price subsidy is not incorporated into the GMP, as a self-financing mechanism, consumers' price remains at $P_g$ and consumption is maintained at $Q_4$. The impact of the price subsidy would be a decline in import by $(Q_4 - Q_5)$, while producer surplus increased to $P_w$ $P_s$ ga from the previous $P_w$ $P_g$ ca. The cost to the government is indicated by the area Pg Ps gk, and the producer surplus is the area Pg Ps gc. Producer efficiency loss is denoted by the area gck.

### 4.5.2 Impact on domestic prices

In estimating the potential impacts on domestic prices resulting from liberalization, two price linkage equations are estimated. The first is to identify the relationship between the retail price and the protection. The two main variables hypothesized to influence retail prices are import price and also the protection rate for the rice industry. For this purpose a tariff equivalent (TE) of 40% is used to quantify the protection. This TE is based on the bound rate notification of Malaysia to GATT for rice, which is assumed to be the "tariff-equivalent-protection" for the rice industry.

Based on this, the retail price equation is specified as follows:

$$L_nRREPR_t = f\,(L_nRIMPR_t, L_nRTF_t)$$

where

$L_nRREPR_t$ = natural log of retail price in year t in RM/ton divided by the CPI

$L_nRIMPR_t$ = natural log of import price in year t in RM/ton divided by CPI

$L_nRTF_t$ = natural log of tariff-equivalent of protection to rice sector in RM/ton divided by CPI in year t

Estimation yields the following results:

$$L_nRREPR = \underset{(-1.299)}{-1.292575} + \underset{(0.205)}{0.061315}\, L_nRIMPR + \underset{(1.436)}{0.230510}\, LnRTF \qquad \text{(Equation 1)}$$

$R^2 = 0.4769$; Adj. $R^2 = 0.4188$; n = 22; D.W. = 1.01

The t-values are given in parentheses.

From the estimation, the elasticity of price transmission of retail price with respect to TE is 0.2305. This means that a 1% decrease in TE will decrease retail prices by 0.2305%. Hence, a 40% decrease in TE will result in retail prices to decreasing by 9.32% (0.2305 × 40 = 9.32).

The second price linkage equation simply links the retail price to the farm price and is specified as:

$$L_nLNFMPR = f\,(L_nREPR)$$

where:

$L_nLNFMPR$ = natural log of farm price in RM/ton

$L_nREPR$ = natural log of retail price in RM/ton

The estimated results are as follows:

$$L_nLNFMPR = \underset{(-23.326)^{***}}{-0.114381} + \underset{(42.32805)^{***}}{1.116236}\text{ en } REPR \qquad \text{(Equation 2)}$$

$R^2 = 0.9$; Adj. $R^2 = 0.9$ ; n = 22; D.W. = 1.0

The t-values are given in parentheses, with *** indicating significance at the 1%, probability level.

From the estimation of Equation 2, the elasticity of price transmission of the farm price with respect to the retail price is 1.1162. This means a 1% decrease in retail price would result in a 1.1162% decrease in farm price. Using the 1996 farm price, liberalization would cause the farm price of rice to decline to RM 1.24 per kg.

### 4.5.3 Impact on supply

The supply response model is specified as follows:

$$DSt = f\left(\frac{PRt\text{-}1}{CPI}, Qt\text{-}1, TECt, AREAt\text{-}1, FERT\right)$$

where:

| | | |
|---|---|---|
| $DS_t$ | = | domestic supply of rice in tons |
| $P_{Rt-1}$ | = | lagged farm price of rice in RM/ton |
| $AREA_{t-1}$ | = | lagged planted area in hectares |
| $TEC_t$ | = | technology progress (YEAR) |
| FERT | = | fertilizer quantity |

However, after experimentation with the model, the best-fit model is as follows:

$$\begin{aligned} DSt = {} & \underset{(2.821)^{**}}{-37586000} - \underset{(-2.183)^{**}}{0.61846\, AREA_{t-1}} + \underset{(0.9187)^{ns}}{301.34\, PR_t} \\ & + \underset{(4.001)^{**}}{19622\, TEC_t} \end{aligned} \qquad \text{(Equation 3)}$$

$R^2 = 0.5714$; Adj. $R^2 = 0.4910$; n = 22; DW = 2.0114

The t-values are given in parentheses, with ** indicating significance at the 5% level.

The coefficients for the lagged price and technology have the expected positive sign. The coefficient for lagged area planted also has the expected negative sign. All variables are significant at 5% except for the lagged price. The non-significant response for the lagged price is consistent with prior studies. Since price is rigidly controlled and resources are limited (especially paddy land and water), the rice supply response to price changes is also limited. Historically, price reviews and changes are always upwards and never downwards, so such past studies usually concentrated on the effects of increase in price and seldom on decrease in price. For this study, the price coefficient is still useful in assessing downward changes in supply, since producers would certainly respond correspondingly when profitability declines. Based on the price coefficients derived, the elasticity of supply estimated at means, was at 0.13. This is comparable to the estimate obtained by Ahmad Zubaidi (1990), which was 0.11, and that of Nik Fuad (1985) at 0.17. The World Bank (1988) used the supply elasticity of 0.2 in calculating the impact of price intervention in the paddy sector in Malaysia.

What is certain, however, is that paddy production in this country is very inelastic, implying that changes in paddy price will have very little impact on domestic production. Hence, the current paddy price structure is not effective in increasing domestic paddy production in spite of the attractive price support program. It is probable that under the current paddy price structure, which is guaranteed and fixed, with little change over the years (except when the GMP is revised), the supply response to paddy price is going to be low. Furthermore, even with very favorable prices, the supply response is also expected to be low, since increased production is severely constrained by availability of irrigated paddy area, while in the single cropped areas, water availability is a major limitation (Ahmad Zubaidi 1990).

From Equation 1, a 1% decrease in tariff will result in a 0.2305% decrease in retail price. Hence the dismantling of the current protection on rice at 40% will result in 9.22% decrease in retail price. Equation 2 also indicates that a 1% decrease in retail price would lead to a 1.1162% decrease in farm price. This means that when the retail price is reduced by 9.22%, the farm price will decrease by 10.29% (9.22% x 1.1162). With the rice supply elasticity at 0.13, a 10.29% decrease in farm price would decrease rice production by 1.34%. Based on 1996 production figures, this is equivalent to 19,280 tons of rice. The farm price under a liberalized scenario would be RM1.24/kg rice, which is equivalent to RM0.81/kg paddy.

### 4.5.4 Impact on demand

The findings by Ahmad Zubaidi (1990) were used for this purpose. This study is considered one of the most comprehensive studies in modeling the rice sector in Malaysia and is frequently used by policy makers in making decisions in the rice sector. It is also expected that the demand structure for rice in Malaysia has not significantly changed since this study and its findings including its empirical estimates are still very much relevant today. Basically the consumption side of the model was specified with per capita consumption of rice as a function of retail prices for rice and wheat and per capita GNP. The demand function was specified as follows:

$DDR_t$ = $f(PR_t, PW_t, YM_t)$

$DDR_t$ = per capita consumption of rice in kg

$PR_t$ = price of rice in RM/kg

$PW_t$ = price of wheat in RM/kg

$YM_t$ = per capita income in RM

The estimated log-linear equation obtained was as follows:

$$DDRt = \underset{(2.327)^{***}}{0.1855} - \underset{(2.729)^{***}}{0.3090\ PR_t} + \underset{(4.898)^{***}}{0.5486\ WP_t} - \underset{(2.812)^{***}}{0.2396\ YM_t}$$

$R^2 = 0.5885$; DW = 1.4503

The t-values are given in parentheses, with *** indicating significance at the 1% level.

All coefficients were statistically significant. The coefficients for own price, price of wheat and income parameters had the expected signs. The own price elasticity was negative, at 0.309, and the cross price elasticity was 0.5486, indicating the existence of substitution between rice and wheat. The study also indicated that rice is an inferior good, while wheat is a normal good. Hence, as income increases, the demand for rice decreases whilst the demand for wheat increases. These findings were fairly consistent with that derived by Armodee's (1969) where the price elasticity ranged between -0.2 and -0.5. Nik Fuad's (1985) estimation was -0.5.

Based on the elasticity of price transmission between retail price and tariff at 0.2305%, a 40% decrease in protection (i.e. complete liberalization) would result in 9.22% decline in retail price. Based on the 1996 retail price of rice at RM1.48/kg, the new retail price under a liberalized scenario would be RM1.34/kg. With demand elasticity at -0.31, a 9.22% decrease in retail price could lead to a 2.86% (9.22% x 0.31) increase in quantity demand. The total rice consumption for the year 1996 was 2,015,384 tons. Hence a 2.86% increase in demand is equal to an additional 57,640 tons of rice. Total demand would increase to 2,073,024 tons.

### 4.5.5 Implications after global liberalization

The impact of global liberalization on the rice sector is an increase in global rice trade, while the international rice price in real terms may experience a 15% rise over the base period, compared to a 7% rise in the baseline projections without the Uruguay Round effect (FAO 1995). The price difference between the domestic and world markets for the period 1975 -1996 is shown in Table 4.10. During this period the domestic price is always higher than that of world price, except for the period 1980-1984. This was due to the protected nature of the domestic market. During the period 1995-1996, the average domestic price of rice was 68% higher than the world price. Under this situation, where the world price is much lower than the domestic price, an increase by 15% of the world rice price would have a negligible impact on consumer and producer prices in the domestic market. Hence, liberalization of rice at the international level would most likely have relatively little effect on the domestic rice industry, compared to the outcome of liberalization initiatives by Malaysia itself.

**Table 4.10 Price differential between domestic price (wholesale) and world price (RM).**

| Period | Domestic Price | World Price | % Domestic/World Price |
|---|---|---|---|
| 1975 - 1979 | 770 | 754 | 102 |
| 1980 - 1984 | 770 | 795 | 97 |
| 1985 - 1989 | 762 | 663 | 115 |
| 1990 - 1994 | 946 | 727 | 130 |
| 1995 - 1996 | 1,390 | 827 | 168 |

Source: Ministry of Agriculture: various issues.

### 4.5.6 Welfare effects

Based on the analyses, the impact of withdrawal of the paddy price subsidy program is quantified. The 1996 statistics of the rice industry are used for this purpose.

*Gain in consumer surplus*

This gain is due to the ability of consumers to consume more at lower prices. The consumer surplus is the sum of the value of the original consumption and the value of additional consumption based on the price differential. The 1996 consumption of rice was 2,015,384 tons. With the cheaper price of RM140 per ton (RM1,480 – RM1,340), the surplus is RM282.2 million. Consumption also increases by 57,640 tons, and with the similar price differential, the surplus is RM4.0 million. Hence the total gain in consumer surplus brought about by the liberalization is RM286.2 million.

*Loss in producer surplus*

The producer surplus is also calculated on the same basis as the consumer surplus. It measures the sum of the values of the new level of production and the value of rice not produced due to a decline in farm price by RM160 per ton. The new rice production level at 1,419,514 or 2,228,489 tons of paddy (based on 1996 production) takes into consideration the decrease in rice production of 19,280 tons or 29,862 tons of paddy. The value of the new level of production is RM351.78 million, and the value of rice not produced is RM2.39 million. Hence, the total loss in producer surplus is RM354.17 million.

*Increase in imported rice*

Total increase in imported rice is equivalent to the sum of the increase in demand and the decrease in supply. From the new demand and supply estimates resulting from liberalization, demand increases by 57,640 tons whilst production declines by 19,280 tons. This shortage totaling 76,920 tons has to be fulfilled by importation. Based on the world price of RM851/ton in 1996, an additional RM 65.5 million will have to be spent for imported rice.

*Reduction in government expenditure*

The current rate of price subsidy is RM248/ton paddy, which is equivalent to RM380/ton rice. Considering the 1996 paddy production of 2,228,489 tons, the total government expenditure to support the paddy price subsidy program is equivalent to RM553 million. The actual expenditure incurred by the government to support the program is about RM400 million per year. This is due to the ineligibility of some producers to receive the price support due to their larger scale of operation. In addition, a small proportion of rice is also used for home consumption. This sum will be saved once the price support program is terminated.

## 4.6 Location-specific study: MADA region

### 4.6.1 Historical perspectives

MADA is the largest and the most important granary area in the country in terms of both size and output. The choice of MADA as a case study is partly based on this, in addition to the fact that the region in one of the most efficient paddy producing regions in the country. The first phase of the irrigation scheme, better known as Muda I, started in 1969. This represents the largest agricultural development project in the First Malaysia Plan to enable double cropping of 96,000 hectares of paddy field in the coastal plain of the northern states of Kedah and Perlis in Peninsular Malaysia. Financed by the World Bank, the project was completed in 1972 at a cost of RM238 million. By 1974, 92% of the area in the scheme was under double cropping, with a cropping intensity of 170% (Kean and Meng 1996). Average yield increased by 1.2 ton per hectare under irrigation. Subsequently, total paddy output increased from 380,000 tons in 1970 to 690,000 tons in 1980. This was later followed by the implementation of Muda II in 1978, with the objective of increasing water use efficiency through the intensification of canals, drains and farm roads, at a cost of RM226 million (Jegathesan 1996a, b). The source of irrigated water came from three main reservoirs, namely Muda, Pedu and Ahning reservoirs with total a catchment area of 127,000 hectares and storage capacity of 400 million $m^3$.

### 4.6.2 The MADA region

The MADA irrigation scheme is located in the northwest region of Peninsular Malaysia, covering both the states of Kedah and Perlis. The total area is about 126,000 hectares, of which 77,300 hectares are located in northwest Kedah and the remainder in the southern part of Perlis. About three-quarters of the total area is under rice cultivation, with the rest under of other cash crops, and urban and residential areas.

The region is currently the largest rice-producing area in the country, representing 29% of cultivated area and 41% of total national output. The cropping intensity is now approaching 200%, indicating that almost all paddy fields are double cropped. The MADA area is located in one of the most fertile plains in the country, under the influence of the tropical monsoon with an average annual rainfall of 290 cm and temperature of $28^0$C (Alias et al. 1990). Drought is usually experienced between the months of November and March, when average monthly rainfall drops to about 100 mm. The months, of August and November are considered the rainy period with average monthly rainfall in the region of 200-300 mm. The difference in the rainfall pattern, especially the drought and the rainy season, is the major factor in determining cropping schedule. Similarly, total rainfall and its distribution are critical in ensuring adequate water supply for irrigation purposes.

*Socio-economic profile of paddy farmers*

Basic information on the farmers and their farms in MADA is shown in Table 4.11. There was a decrease in the total number of households involved in paddy production, from 63,000 households in 1983 to 47,000 in 1992. This scenario is in line with the overall reduction in number of paddy farmers in the country. The average family size is 4.5, slightly smaller then the size in 1983. The average age of farmers recorded in1992 was 53.8 years, ranging from 23 to 75 years old. Sixty percent of them were 51 years or older. In 1983, the average age was 46.4 years. It is thus very likely that the same set of farmers were involved in paddy production over the years with minimal new entrants. Furthermore, there was not much change in educational status of these farmers, most of whom have minimal primary school education.

**Table 4.11 Profile of the farmers and their farms, (1983-1992).**

| | 1983 | 1992 |
|---|---|---|
| The farmers | | |
| • total households | 63,000 | 47,000 |
| • average family size | 5.2 | 4.5 |
| • average age | 46.4 | 53.8 (1997) |
| • educational level (majority) | primary | primary |
| The farm | | |
| • average size/household | 1.4 | 1.99 |
| • land ownership (%) | | |
| - owner | 47.4 | 29.4 |
| - tenant | 26.6 | 30.4 |
| - owner-tenant | 17.4 | 35.5 |
| - others | 8.6 | 4.7 |

Source: Wong (1983); Jegathesan (1996a, b).

The average farm size was 1.99 hectare per farm household, almost double the national average of 1.03 hectares. This is an increment of 42% as compared to the size of 1.4 hectares in 1983. The increment was brought about primarily by the reduction in the number of farmers involved in rice cultivation, which resulted in bigger holdings for the remaining farmers, either through land purchase or renting. Consequently, the percentage of owner-operators declined, while that of tenant-operator and owner-tenant increased, indicating to some extent that the process of land consolidation had taken place. While there are cases of fertile rice fields being converted to other more lucrative purposes, it is not very widespread and concentrated only in a few locations.

## *Paddy yield, cultivated area and paddy production*

Statistics on yield, cultivated area and production of paddy in the period 1970 to 1995 are shown in Table 4.12. During the period, the area under rice production increased substantially from 126,400 hectares in 1970 to almost 194,000 hectares in 1995, an annual growth of 1.7%. In spite of lower growth in yield performance (at 0.7% per annum), paddy production from the region increased by almost 85% from about 468,000 tons in 1970 to more than 860,000 tons 1995, registering an annual growth rate of 2.44%. The increase was primarily due to a remarkable expansion in double cropping area, introduction of new high yielding varieties and better crop management practices.

**Table 4.12 Cultivated area, production and yield of paddy in MADA, 1970-1995.**

| | 1970 | 1975 | 1980 | 1985 | 1990 | 1995 | Annual Growth Rate |
|---|---|---|---|---|---|---|---|
| Planted area ('000 ha) | 126.4 | 184.5 | 185.4 | 186.2 | 189.6 | 193.8 | 1.71 |
| Production ('000 tons) | 467.9 | 723.6 | 740.5 | 701.0 | 752.8 | 862.2 | 2.44 |
| Yield (ton/ha) | 3.70 | 3.92 | 3.99 | 3.76 | 3.97 | 4.45 | 0.74 |

Source: MADA 1996.

The level of yield achieved is among the highest in the country. For comparison purposes, the same performance indicators (area, production and yield) are used to assess production performance in MADA in relation to the other seven granaries in the country. The results of the comparison are shown in Table 4.13. For the period 1985-1995, area, production and yield recorded positive growth in MADA and other the granaries. However, the growth rates are consistently higher in other granaries than in MADA. This is probably due to the fact that development of other granaries in terms of double-cropping activities was undertaken at a later stage than in MADA. MADA on the other had could be considered to be almost approaching to its full potential.

Nevertheless, MADA's share in terms of planted area and production as compared to the rest of the granaries has consistently contributed more than half of total planted area and production in most years. The mean contribution during the 1985-1995 period in terms of planted area was about 52%, and 57% in terms of production. However, there is indication of a negative annual growth for these indicators during the same time period. This is especially true in terms of percentage share of paddy production in MADA to other granaries where a negative growth of about 1% per annum was recorded. On average, MADA's yield level is about 20% more than that of other granaries.

*Cost and return analysis*

A summary on cost and return analyses in MADA is presented in Table 4.14, on both a per hectare and per farm basis. The cost per hectare ranges between RM834 for owner-operator to RM1,539 for owner-tenant. This difference in costs is mainly due to land rent, which accounts to about 50% of the cost of production. The average cost of production per hectare for the region is RM1,194. Other major cost components are land preparation and harvesting. These two components account for about half of the cost of production, if land rent is excluded. The land rent (on a per hectare basis) is more expensive for the owner-operator than for the tenant-operator. A possible reason is that in most cases the tenant-operator has a long-term contract in land rent. The charge rate for land preparation is currently at RM270 per hectare and harvesting by combine harvester at RM240 per hectare. A study by the World Bank (1988) indicated the total cost of production of an owner-operator was at RM511 per hectare. This represented a RM323 increment in cost of production in less than 10 years, an increase of 63%.

The gross receipts represent the actual cash received from the sales of paddy. It is based on the guaranteed minimum price plus bonus payments. On a per hectare basis, there is no significant difference in terms of gross receipts under the different tenure systems. On a per farm level basis, the amount is definitely higher for the tenant-operator due to the larger farm size. Likewise, tenant-operators registered the highest income level, with net returns of RM5,730 compared to RM3,797 and RM2,309 for owner-operators and owner-tenant-operators, respectively. This is equivalent to the monthly income of RM955, RM633 and RM385 for the different tenure systems, respectively.

**Table 4.13 Planted paddy area ('000 ha), production ('000 ton) and yield (ton/ha) for MADA in relation to other granaries.**

| Year | MADA | | | Other Granaries | | | % Share MADA to Other Granaries | | |
|---|---|---|---|---|---|---|---|---|---|
| | Planted Area | Production | Yield | Planted Area | Production | Yield | Planted Area | Production | Yield |
| 1985 | 186.2 | 701.0 | 3.76 | 145.2 | 421.3 | 2.90 | 56.2 | 62.5 | 129.7 |
| 1986 | 186.7 | 659.2 | 3.53 | 147.4 | 441.9 | 3.00 | 55.9 | 59.9 | 117.7 |
| 1987 | 184.9 | 576.8 | 3.12 | 174.2 | 504.4 | 2.90 | 51.5 | 53.3 | 107.6 |
| 1988 | 188.3 | 651.3 | 3.46 | 174.2 | 459.5 | 2.64 | 51.9 | 58.6 | 131.1 |
| 1989 | 189.5 | 672.4 | 3.55 | 160.6 | 497.3 | 3.09 | 54.1 | 57.5 | 115.3 |
| 1990 | 189.7 | 724.9 | 3.82 | 183.9 | 572.3 | 3.11 | 50.8 | 55.9 | 122.8 |
| 1991 | 189.6 | 752.8 | 3.97 | 188.5 | 644.4 | 3.42 | 50.1 | 53.9 | 116.1 |
| 1992 | 189.5 | 763.9 | 4.03 | 195.1 | 665.0 | 3.41 | 49.3 | 53.5 | 118.2 |
| 1993 | 189.3 | 788.0 | 4.16 | 200.4 | 704.3 | 3.51 | 48.6 | 52.8 | 118.5 |
| 1994 | 193.9 | 846.2 | 4.36 | 190.0 | 630.5 | 3.32 | 50.5 | 57.3 | 131.3 |
| 1995 | 193.8 | 862.2 | 4.45 | 189.4 | 665.5 | 3.52 | 50.6 | 56.4 | 126.4 |
| % Growth/ Annum | 0.40 | 2.07 | 1.68 | 2.65 | 4.57 | 1.94 | -0.01 | -1.03 | 0.29 |

Source: Department of Agriculture, Malaysia (various issues).

**Table 4.14 Farm level average cost of production and return (RM/hectare and RM/farm) under different tenure status, MADA.**

| Item | Owner-Operator | | Owner-Tenant-Operator | | Tenant-Operator | | All | |
|---|---|---|---|---|---|---|---|---|
| | RM/ha | RM/farm (1.46 ha) | RM/ha | RM/farm (1.83 ha) | RM/ha | RM/farm (2.65 ha) | RM/ha | RM/farm (1.99 ha) |
| Land preparation | 224.85 | 328.28 | 234.14 | 428.48 | 232.92 | 617.24 | 230.80 | 459.29 |
| Hired labor for land preparation | 2.59 | 3.78 | 1.17 | 2.14 | 3.26 | 8.64 | 2.33 | 4.64 |
| Seed cost (imputed) | 42.42 | 61.93 | 42.42 | 77.63 | 42.42 | 112.41 | 42.42 | 84.42 |
| Crop establishment | 82.19 | 120.00 | 63.08 | 115.43 | 65.95 | 174.76 | 71.94 | 143.16 |
| Fertilizers purchased | 2.28 | 3.33 | 8.85 | 16.19 | 5.14 | 13.62 | 5.22 | 10.39 |
| Subsidy fertilizer transport | 9.92 | 14.48 | 9.07 | 16.60 | 8.40 | 22.26 | 9.04 | 17.99 |
| Pesticides | 50.38 | 73.55 | 58.40 | 106.87 | 49.93 | 132.31 | 52.56 | 104.64 |
| Labor for input application | 8.59 | 12.55 | 8.08 | 14.79 | 11.35 | 30.08 | 9.48 | 18.86 |
| Combine harvesting | 221.67 | 323.64 | 216.30 | 395.83 | 217.88 | 577.38 | 218.66 | 453.13 |
| Bagging & in-field transport | 45.80 | 66.87 | 43.91 | 80.35 | 35.92 | 95.18 | 41.15 | 81.89 |
| Transport to mill | 116.57 | 170.19 | 115.06 | 210.56 | 115.92 | 307.19 | 114.93 | 228.71 |
| Land tax & water rates | 26.50 | 38.69 | 2.49 | 4.55 | 15.24 | 40.39 | 16.63 | 33.10 |
| Sub total: | 833.76 | 1,217.29 | 802.97 | 1,469.42 | 804.33 | 2,131.46 | 815.16 | 1,622.22 |
| Land rent | - | - | 736.33 | 1,347.48 | 390.86 | 1,035.77 | 379.46 | 755.12 |
| Total cost | 833.76 | 1,217.29 | 1,539.30 | 2,816.90 | 1,195.19 | 3,167.23 | 1,194.62 | 2,377.34 |
| Net paddy yield (kg) | 4651 | 6,790.46 | 4,547.00 | 8,321.01 | 4,626.00 | 12,258.90 | 4,589.00 | 9,132.11 |
| Gross receipt | 3,591.48 | 5,014.84 | 3,362.61 | 5,126.08 | 3,595.78 | 8,897.97 | 3,426.19 | 6,691.85 |
| Net return | 2,757.72 | 3,797.55 | 1,823.31 | 2,309.18 | 2,200.59 | 5,730.74 | 2,231.57 | 4,314.51 |

Source: Jegathesan 1996.

### 4.6.3 The impact of liberalization in the case study area (MADA)

The immediate effect based on the quantitative analyses would be a decrease in paddy production due to changes in farm prices, which will consequently affect farm income. A possible reduction in the cost of production due to liberalization is very marginal since the current import tax on fertilizers and chemicals is only 0 to 5%. The 1995 statistics are used for comparison purposes. Paddy production would decline by 1.75%, which is equivalent to 15,086 tons of rice. The farm price of rice is also reduced by about 10% to RM1.24/kg, which is equivalent to RM0.81/kg of paddy. Based on this new farm price, the net income derived from paddy production in MADA for a sample farm is reduced by about 13.6% per hectare or 15.4% per farm of 1.99 hectares, which is the mean farm size in MADA (Table 4.15).

**Table 4.15 Impact of paddy price reduction on farm income.**

| Item | Per ha | Per farm (mean: 1.99 ha) |
|---|---|---|
| Paddy yield (kg) | 4,589 | 9,132 |
| Paddy price without subsidy (RM/kg) | 0.81 | 0.81 |
| Paddy price with subsidy (RM/kg) | 0.91 | 0.91 |
| Gross receipt (RM) | 3,717 | 7,396 |
| Cost of production (RM) | 1,195 | 2,377 |
| Net return without subsidy (RM) | 2,522 | 5,019 |
| Net return with subsidy (RM) | 2,918 | 5,933 |
| Income reduction (RM) | 396 | 914 |
| % income reduction | 13.6 | 15.4 |

Source: Jegathesan 1996.

### 4.6.4 An alternative analysis of price intervention and its impact on farm profitability

An assessment on the impact of the withdrawal of price intervention can also be analyzed in terms of farm profitability. This would measure the final income received by the farmers with or without price support and subsidy. Based on the actual cost of production and returns from farms presented in Table 4.13, the impact of the various price interventions on farm income in MADA is analyzed, across different tenure and farm size groups (Table 4.16).

Several deductions follow from the analysis:

- With or without price intervention, paddy production is still a profitable undertaking, but the profits obviously decline as price support is withdrawn.
- Since the imputed value for fertilizer subsidy is only about RM144 per hectare, the impact of the withdrawal of the subsidy is fairly minimal. On a per farm basis this constitutes income reduction of between RM210 for owner-operator, and RM381 for tenant-operator, equivalent to 5% and 6% of total farm income, respectively.
- The withdrawal of the paddy price subsidy will significantly effect farm income. For all farm categories, the paddy-price subsidy alone constitutes almost 50% of farm income at RM1,154 per hectare. For owner-operator, due to higher costs of production, the paddy price subsidy component constitutes about 60% of total farm income.
- Under a situation where all subsidies are withdrawn, farm profitability (for all farms) declines further to RM2,034 per farm, a decline of about 58%. This means that under the current structure, the subsidy components (fertilizer and price support) constitute about 58% of total farm income for all farms. The highest contribution is derived by owner-tenants, where these subsidies contribute about 68% (RM2,400) of total farm income. The withdrawal of the subsidy will only mean a similar reduction in income, equivalent to about RM200 per month.

**Table 4.16 Structure of costs, subsidies and returns (RM/hectare and RM/farm) by tenure status.**

| Item | Owner-Operator | | Owner-Tenant-Operator | | Tenant-Operator | | All | |
|---|---|---|---|---|---|---|---|---|
| | RM/ha | RM/farm (1.46 ha) | RM/ha | RM/farm (1.83 ha) | RM/ha | RM/farm (2.65 ha) | RM/ha | RM/farm (1.99 ha) |
| Gross value of paddy sales | 2,428.73 | 3,343.53 | 2,194.34 | 3,974.22 | 2,243.92 | 5,880.31 | 2,272.27 | 4,411.19 |
| Paddy price subsidy | 1,162.75 | 1,671.31 | 1,168.27 | 2,141.25 | 1,151.86 | 3,017.66 | 1,153.92 | 2,280.66 |
| Imputed fertilizer subsidy value | 144.08 | 210.35 | 144.08 | 263.67 | 144.08 | 381.81 | 144.08 | 286.72 |
| Gross receipts | 3,735.56 | 5,216.19 | 3,506.69 | 6,379.14 | 3,539.86 | 9,279.78 | 3,570.27 | 6,978.57 |
| Cash production costs | 833.76 | 1,217.29 | 802.97 | 1,469.42 | 804.33 | 2,131.46 | 815.16 | 1,622.22 |
| Land rent | - | - | 736.33 | 1,347.48 | 390.86 | 1,035.77 | 379.46 | 755.12 |
| Net returns | 2,901.80 | 3,998.90 | 1,967.39 | 3,562.24 | 2,344.67 | 6,112.55 | 2,375.65 | 4,601.23 |
| Net returns less fertilizer subsidy | 2,757.72 | 3,788.55 | 1,823.31 | 3,298.57 | 2,200.59 | 5,730.74 | 2,231.57 | 4,314.50 |
| Net returns less price subsidy | 1,739.05 | 2,327.59 | 799.12 | 1,420.99 | 1,192.81 | 3,094.89 | 1,221.73 | 2,320.57 |
| Net returns less price and fertilizer subsidy | 1,594.97 | 2,117.24 | 655.04 | 1,157.32 | 1,048.73 | 2,713.08 | 1,077.65 | 2,033.85 |
| Net paddy yield (kg) | 4,651 | 6,790 | 4,547 | 8,321 | 4,626 | 12,259 | 4,589 | 9,132 |

Source: Jegathesan 1996.

In short, the withdrawal of the price subsidy will result in two immediate effects. Firstly, paddy price will be reduced by the amount of the paddy price subsidy, and the cost of production will be increased by the value of the free fertilizer given to farmers in the form of fertilizer subsidy. Other than that, it is expected that there is going to be a marginal decline in land rent in view of the expected decline in demand for land since paddy cultivation will not be as profitable as before.

## 4.7 Policy implications and recommendations

In recapitulation, liberalization of the rice sector as expected would decrease domestic supply while increasing demand. There are all round efficiency and welfare gains that will benefit Malaysia, mainly brought about by the increase in consumer surplus and a decrease in government spending. However, imports will increase quite significantly to cater for the increased demand-supply gap. Farm income is reduced by about 15%.

The quantitative estimations of the effects of liberalization appear to be small. Supply for example is expected to decrease only by 1.34%. However, caution must be exercised in interpreting the quantitative results. The elasticity of supply estimated for the Malaysian case mostly captured the supply response due to the price increase, since price controls and GMP were always revised upwards. Thus, the behavior of supply, if price goes down, has never been captured in the time series data that were used. As such the decrease in supply can be underestimated. Not withstanding this reality, the fact remains that liberalization in the rice sector in the long run would be beneficial to Malaysia. However, the government needs to carefully consider two main issues before liberalization. Firstly, the concerns on food security, and, secondly, the income and poverty issues in the rice sector. From the analysis, it appears that the food security objective is not very much compromised, even if total liberalization takes place. However, poverty and income issues are more delicate issues to handle. While the analysis indicates a fairly small implication on farm incomes, any decline in the income of the poor without compensation, however small, can lead to serious political and social consequences. Furthermore, there is a strong possibility that the actual decline in income by this study can be underestimated, resulting from underestimation of the level of protection in rice section (the TE). The previous analyses on farm profitability based on actual survey of farmers indicated significant financial implications for the farmers. Depending on the tenure status and farm size, the farm income could be reduced by as much as 68% per season.

Based on these arguments, the following recommendations can be considered:

- New and additional infrastructure: New and additional investments in new areas especially in the states of Sabah and Sarawak as well as infrastructure improvements in existing areas to induce productivity and efficiency gains that will increase competitiveness are needed as a long-term solution. Savings from the allocation to the support price support program could be channeled to increase paddy production dramatically by the construction of new irrigation schemes. The government can put in this one-time investment that will open up further investment opportunities in production by the private sector. In this manner the economies of scale in rice farming are allowed to operate.
- Farm consolidation: Reduced farm income could be compensated for by increasing farm holdings. This could be accomplished through a land consolidation exercise fully supported or sponsored by the government. Special funds could be established to provide assistance for efficient and enterprising farmers to acquire paddy land from inactive, part-time farmers. The number of farmers should be drastically reduced; inefficient farmers with uneconomic holdings should be moved out from the sector and compensated with direct income support programs, especially those support measures that are acceptable to WTO.

- Enhancing rural employment opportunities: The real problem relating to the issue of poverty and low incomes in the rice sector is not actually farm profitability, but rather scale of operation. The farm size of an average farm in most cases cannot sustain an income above the poverty income line. Other sources of income, off-farm and non-farm are needed. Intensifying rural industrialization would fit nicely into the scenario, considering that the man-days required for paddy cultivation are getting fewer due to increased mechanization. More employment opportunities need to be created so that the reduction of income from paddy can be compensated with alternative sources of income.
- Strengthening institutional support: Another long-term solution is again aimed at increasing productivity and efficiency. Investments by the government in R&D, extension and technology transfer must continue and be strengthened. Funds for R&D in traditional areas such as breeding and farm management practices must continue to be made available, while new and additional funding in emerging areas such as genetic engineering and biotechnology have to be allocated. Additionally, credits and loans need to be made available to allow present farmers and new investors to expand operations in rice cultivation.

# 5. Tobacco

## 5.1 Introduction

This chapter examines the effects of trade liberalization on the Malaysian tobacco industry. This analysis consists of the impact on prices of cured tobacco, farm price of uncured leaves, imports, consumer and producer surpluses, as well as impacts on farm incomes resulting from liberalization of the tobacco trade in Malaysia.

As with the previous two commodity chapters, this chapter also starts with background information the tobacco industry, including aspects of production, demand and trade as well socio-political aspects of tobacco production in Malaysia. This is followed by a description of policy interventions by the government in the tobacco industry at the various levels of production and also trade. The next section deals with quantitative evaluation of the impacts of liberalization using econometric modeling of supply, demand, including import demand as well as the estimation the price linkage equations to identify the linkage between world price, tariffs and domestic prices. The last section evaluates the potential effects of liberalization of the tobacco industry in the district of Bachok, in the state Kelantan, the main tobacco growing area in the country.

## 5.2 The Malaysian tobacco industry

Tobacco was first introduced in Malaysia by the Malaysian Tobacco Company (MTC) (previously known as the Malayan Tobacco Company) in 1959 on an experimental basis. It started with an eight-hectare plot for experimentation on suitability of varieties, soil types, techniques of cultivation and post-harvest handling. This experimentation was done in collaboration with a number of small farmers. After the experiments ended, commercial production started in 1963 with an area of 283 hectares producing only 140,614 kg of cured leaves. Small farmers cultivated tobacco and sold it to MTC on a contract basis. The company provided technical know-how, supervision and inputs, while farmers put in labor and provided land. Uncured fresh leaves were sold to MTC and deductions were made for the input credit provided by the company. This arrangement between small farmers and MTC continued until 1970.

By 1970, tobacco cultivation had expanded by more than four-fold to 1,216 hectares within a span of just seven years. Production of cured leaves had by then reached almost 1.4 million kg. Small farmers were lured into tobacco by relatively attractive returns and a sure market for their produce. As cultivation expanded rapidly, the tobacco industry was then confronted with a variety of problems including excess supply and poor quality. This was mainly due to unhealthy competition, poor cultural practices and lack of extension services and supervision. MTC found difficulty in controlling the industry and stopped being actively engaged in production and just became one of its main buyers (Mohd Noor Mamat 1985). Local entrepreneurs then set up curing companies taking the place of MTC.

As the industry expanded, the situation became increasingly chaotic. The problem in the industry had by then transformed into a socio-political problem as tobacco cultivation was undertaken by poor small farmers. A task force was appointed by the government to study the matter and looked into the problem. This task force recommended regulation of the industry, which led to the setting up of the National Tobacco Board (NTB), whose main function is to provide order to the industry. Today the industry is the most highly regulated agricultural industry in the country with the highest degree of intervention including production quotas, registering of growers and licensing of curers. The industry is also insulated from external competition with extremely high tariffs imposed on imported tobacco.

The industry is now home to about 21,700 families, 374 curers, 723 grower-curers and more than 24,500 station workers involved in the cultivation and curing of tobacco leaves. Total planted area now stands at about 11,000 hectares with production of cured leaves totaling almost 12 million kg.

### 5.2.1 Area and production

Most of the area and production of tobacco is in Peninsular Malaysia. The area under tobacco in East Malaysia, mainly in Sabah accounts for less than 5% of total tobacco area in the country. Production is mainly focused on Malaysian Flue Cured Virginia (MFCV) tobacco while production of the Burley tobacco is very small. Table 5.1 shows the area and production of MFCV tobacco from 1975 - 1996. As can be seen in the table, there has not been much change in both area and production for the last 20 years, except in one or two cases. It can be safely stated that planted area has stabilized at about 10,000 hectares with annual production of about 10 million kg. This is due to the stabilization in demand for MFCV tobacco. Since supply is regulated through production quota, the changes in both area and production were not that substantial.

**Table 5.1 Planted area and production of MFCV, Peninsular Malaysia, 1975-1996.**

| Year | Area (ha) | Production (million kg) |
|---|---|---|
| 1975 | 14,448 | 9.203 |
| 1976 | 8,837 | 4.680 |
| 1977 | 9,499 | 7.275 |
| 1978 | 12,868 | 9.204 |
| 1979 | 12,495 | 7.535 |
| 1980 | 13,238 | 10.497 |
| 1981 | 12,969 | 7.695 |
| 1982 | 12,727 | 9.578 |
| 1983 | 12,793 | 9.685 |
| 1984 | 10,548 | 7.157 |
| 1985 | 16,509 | 9.347 |
| 1986 | 17,553 | 13.641 |
| 1987 | 12,755 | 10.848 |
| 1988 | 9,847 | 7.280 |
| 1989 | 12,903 | 13.637 |
| 1990 | 10,738 | 10.517 |
| 1991 | 15,687 | 9.216 |
| 1992 | 12,817 | 11.245 |
| 1993 | 13,178 | 9.679 |
| 1994 | 10,767 | 6.087 |
| 1995 | 10,500 | 10.300 |
| 1996 | 12,700 | 11.988 |

Source: National Tobacco Board, Malaysia.

## 5.2.2 Tobacco trade

Trade in tobacco is mainly confined to imports. Exports are insignificant. Total imports increased from 7,757 tons valued at RM39.1 million in 1976 to 9,507 tons valued at more than RM127 million in 1995 (Table 5.2). Most the imported tobacco is for flavoring and aroma used for blending with local tobacco. The local tobacco is mostly used as filler.

**Table 5.2 Imports of tobacco, 1976 - 1995, Malaysia.**

| Year | Import Quantity (kg) | Import Value (million RM) |
|---|---|---|
| 1976 | 7,757 | 39.103 |
| 1980 | 4,241 | 61.664 |
| 1985 | 5,581 | 97.358 |
| 1986 | 5,209 | 92.518 |
| 1987 | 3,386 | 59.520 |
| 1988 | 3,048 | 57.087 |
| 1989 | 3,572 | 68.333 |
| 1990 | 4,567 | 81.343 |
| 1991 | 5,543 | 112.511 |
| 1992 | 5,480 | 92.179 |
| 1993 | 5,718 | 89.142 |
| 1994 | 6,320 | 94.925 |
| 1995 | 9,507 | 127.043 |

Source: Department of Statistics, Malaysia.

### 5.2.3 The production system and industry structure

The industry consists of three main groups of players, the growers, curers and the cigarette manufacturers. The growers consist mainly of small farmers with an average planted area of about 0.175 hectares. In general, each farm family handles 1,000 - 3,000 plants per season. In 1997 there was a total of 20,524 registered active tobacco farmers (NTB 1998). These farmers sell the fresh leaves to the curers, who process it into cured leaves. The cured leaves are then sold to manufacturers to be processed into cigarettes. Currently there are 335 active tobacco curers in Peninsular Malaysia.

Each grower must register with the NTB, where he is then issued with a registration card bearing the NTB registration number and his name. The amount of tobacco planted, credit taken and tobacco sales are recorded on the registration card. The grower will subsequently take this card to a curer of his own choice and register with the curer. The condition of this registration is that the farmer must sell his tobacco only to the curer to whom he is registered. This is to enable credit re-payments to the curer.

The curers on the other hand have to be licensed by NTB prior to being able to produce. The curer then has to apply for a production quota from NTB before commencing production and subsequently find the farmers to produce the quota that has been allocated for him by NTB. Curers are also expected to provide credits and field supervision to the farmers. This system is called the curer system.

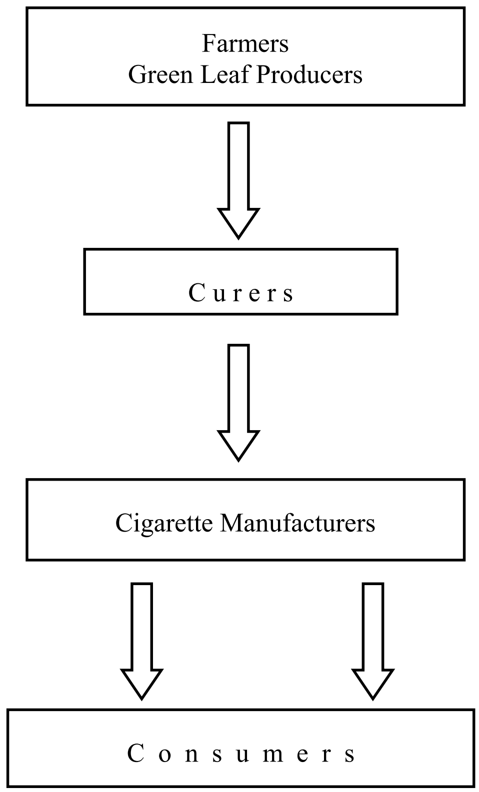
Cigarette manufacturer must also be licensed by the NTB in order to purchase cured tobacco, and manufacture and sell cigarettes to consumers. There are three major cigarette manufacturers in Malaysia that dominate the market and a few smaller ones.

Another system of production practiced is the grower-curer system, where the tobacco farmer grows and cures his own tobacco. However, as of 1997 there were only 1,005 licensed grower-curers. Production from this system accounts for only 14% of total production of MFCV tobacco in Malaysia. The other system is the cooperative system, which is similar to the grower-curer system, but is managed by farmers' associations. Although these two systems are more efficient compared to the curer system, rigidities in the system and the lock-in-nature of the curer production system inhibits a faster transformation in the production system to the more efficient system.

### 5.2.4 Marketing of tobacco

Since it is a highly regulated industry, the marketing channels and stages in the marketing for tobacco are fairly simple (Figure 5.1). Under the curer system, which is the main system practiced, farmers sell the green leaves produced to the curer, who had given the farmer the quota allocation of green leaves to be produced by the farmer. Prices paid to farmers are based on grades fixed by the NTB. After the leaves are cured, they are sold to cigarette manufacturers, who in turn sell the cigarettes to consumers mainly in the domestic market.

**Figure 5.1 The marketing channel for Malaysia tobacco.**




## 5.2.5 Policy interventions in the tobacco industry

Apart from being protected by high tariffs, the Malaysian tobacco industry also receives other forms of support from the government. The NTB serves as the implementing agency for policy instruments in the industry. Amongst the major activities of the NTB are:

- Licensing curers and cigarette manufactures and registering growers,
- Implementing production quotas to balance production with demand,
- Setting proper grading and pricing of green and cured leaves ,
- Controlling and regulating the marketing of green and cured leaves,
- Providing input credit,
- Providing extension services to curers and growers,
- Breeding and supply of tobacco seeds, and
- Providing training for staff, growers, curers and station workers from relevant agencies.

With the establishment of the NTB in 1973, the first major intervention was the introduction of a production quota system in 1974. This was to prevent the influx of farmers and curers into the industry. Curers were given a production quota of cured leaves. The amount of quota given was based on the curers' capability to produce the required quantity as well as quality of tobacco. The curers in turn allocate the quota to green leaf producers consisting of small farmers. About 80% of the total quota is allocated to the less developed states of Kelantan and Terengganu. Kelantan alone receives about 60% of the total quota.

The government also introduced the GMP for both green and cured leaves for all the established grades. The minimum price structure is regulated, specified and revised periodically to stabilize prices, ensure profits, encourage production of quality leaves, and avoid conflicts in the marketing of tobacco leaves. Effective from January 1990, premium prices were introduced as an incentive for growers and curers to produce better quality leaves. All prices were determined on a cost-plus basis to ensure profitability for both curers and growers.

The farmers also receive a fertilizer subsidy, which amounts to 75% of the total fertilizer requirement. This subsidy is borne by the cigarette manufacturers in proportion to the quantity purchased by them. The main objective of this scheme is to ensure correct fertilizing practices by farmers in order to increase yield and quality of tobacco.

NTB also provides an input credit scheme to purchase items such water pumps, small machinery and inputs such as agricultural chemicals, plastic materials and others. This credit scheme is aimed at controlling cost, supply and quality of inputs so as to reduce the cost of production. In addition to the above, MARDI undertakes research in tobacco to improve the output performance of both green and cured leaves. It established a research station in Kelantan that mainly serves the tobacco industry.

In more recent years, with a generally better economy, increased job opportunities and higher rural incomes coupled with the emphasis on creating a healthy society, the government is now proposing to slowly reduce the level of protection accorded to the industry. The industry is now taking steps to consolidate and increase productivity and competitiveness. Parallel with this policy, R&D in tobacco is also slowing down and R&D has now been more focussed on finding alternative crops that can be grown by farmers in the tobacco planting areas. Although no definite decision has been made on the industry, the sentiments of planners are heavily biased towards not encouraging tobacco cultivation.

## 5.3 The commodity study

In this section, the effects of liberalization on the Malaysian tobacco industry are assessed in terms of its macro-economic and welfare related indicators such as consumers' and producers' surpluses, domestic prices and trade.

### 5.3.1 Impact on import demand

In evaluating the effects on import demand, a few variables, namely import price, import tariff and income are hypothesized to influence import demand. Both import price and tariff are expected to be inversely related with import demand while income is expected to be positively correlated with import demand. Based in this hypothesis, the import demand function is specified as follows:

$$IMDM_t = f(IMPR_t, IMTAR_t, GDP_t)$$

where:

$IMDM_t$ = quantity of tobacco imported in year $_t$ in tons
IMPR = import price of tobacco deflated by CPI in RM/ton
IMTAR = import tariff deflated by the CPI in RM/ton
GDP = real GDP in RM million

In the actual estimation, a dummy-slope variable for GDP was introduced based on a hypothesis that in the late 1980s, consumers were beginning to be more health conscious and are more aware on the ill effects of smoking. This may influence the effects of income on import demand. The following estimations are obtained:

$$\begin{aligned} IMDM &= \underset{(9.681)}{16584} - \underset{(-5.691)}{0.4927IMPR^{***}} - \underset{(-1.340)}{0.0620IMTAR} \qquad \text{(Equation 1)} \\ &\quad + \underset{(0.1248)}{0.0032GDP} - \underset{(-0.3682)}{0.0051GDPDUM} \end{aligned}$$

$R^2 = 0.772$; Adj.$R^2 = 0.715$; n = 21; D.W = 2.16

The t-values are given in parentheses with *** indicating significance at the 1% probability level.

The equation seemed to be satisfactory both in terms of the $R^2$ and overall significance. However, only import price is significant. Import tariff is not significant, but its t-value is more than 1. Madalla (1977) suggested variables with t-value more than 1 can be retained in the equation for further interpretation and to prevent bias from exclusion of relevant explanatory variables. All variables also have the expected signs.

Based on the parameter estimate of IMTAR, the elasticity of quantity imported with respect to tariff evaluated at the means is - 0.497, meaning that a 1% decrease in tariff will increase import demand by 0.497%. On the other hand, the elasticity of import quantity with respect to import price is much higher at - 1.43.

The Malaysian tariff rate on imported tobacco has always been on a fixed rate from RM20.72 per kg in 1974, increasing to RM32.84 per kg in 1980 – 1981, and again raised to RM50.00 per kg in 1982. In 1990, a 5% surtax was incorporated into the import duty as ad valorem tax. Based on the average import price of tobacco for the last five years and the tax imposed on imported tobacco, the ad valorem equivalent of the fixed rate is more than 300%. However, taking the average of real tariff rate and import price for the duration of the estimated equation, the ad valorem equivalent of the fixed rate imposed on imported tobacco was 270%. From the elasticity estimated, complete liberalization will increase imports by 134.2% (= 0.497 × 270). Based on the 1995 figure of imports and prices, the additional increase in imports will be the region of 12,758 tons. The additional costs of imports would be more than RM170 million.

### 5.3.2 Impact on domestic prices

In evaluating the impacts of tariff reduction in MFCV tobacco, two price linkage equations are used. These equations are similar to the ones used for the rice industry. The cured price of tobacco in Malaysia is hypothesized to be dependent on the world price and the tariff on imports. It is expected that the tariff will have the more significant influence on domestic prices rather than world price because of the extremely high taxes imposed. The other price linkage equation links cured tobacco price and uncured prices of fresh leaves. The following estimations were obtained for the two price linkage equations:

$$LNPRCURR = \underset{(-1.125)}{-1.5174} + \underset{(2.342)}{0.2632LNWRPR^{**}} + \underset{(2.058)}{0.1612LNTAR^{**}} \qquad \text{(Equation 2)}$$

$R^2 = 0.32$; Adj.$R^2 = 0.25$; n = 22; F = 4.558**; D.W = 1.10

$$PRUNCUR = 0.0993 + 0.0464PRCUR^{***} \qquad \text{(Equation 3)}$$

(2.776) (16.37)

$R^2 = 0.924$; Adj.$R^2 = 0.919$; n = 16; D.W = 1.91

where:

| | | |
|---|---|---|
| LNPRCURR | = | natural log of real price of cured leaves in RM/kg |
| LNWPRR | = | natural log of real world price of unmanufactured tobacco in RM/ton |
| LNTAR | = | natural log of real tariff in RM/ton |
| PRUNCUR | = | price of uncured tobacco in RM/kg |
| PRCUR | = | price of cured tobacco in RM/kg |

The t-values are given in parentheses with a ** indicating significance at the 5% probability level.

The first price linkage equation (Equation 2) is not very satisfactory in explaining variations in the price of cured leaves. Its $R^2$ and Adj. $R^2$ are only 0.32 and 0.25, respectively, meaning that the independent variables only explained 32% of the behavior of cured leaf prices. However, both variables are significant at the 5% level. Since this equation is not used for predictive purposes but rather for determining structural relationships, the estimates can still be accepted.

The elasticity of price of cured leaves with respect to tariff as shown by the parameter estimate is 0.1612. This means that a 1% decrease in tariff will result in a 0.1612% decrease in price of cured leaves. Considering that the tariff equivalent is 270%, total liberalization will reduce the price of cured leaves by 43.524%. If the price of cured leaf in 1996 is used, then its price will decrease to RM7.69 under a zero tariff situation.

From the second price linkage equation, the elasticity of price transmission of uncured tobacco leaves with respect to cured leaf price evaluated at means is found to be 0.854. This means that that a 1% fall in prices of cured tobacco will lead to a 0.854% decline in the price of uncured fresh leaves at the farm level. Hence, a 43.524% decline in price of cured leaves will result in a 37.16% decline of price of green leaves. Given that the price of green leaf in 1996 was RM0.758/kg in 1996, the price with total liberalization will be RM0.476/kg.

### 5.3.3 Effects on domestic demand

A demand function is estimated for MFCV tobacco. This demand is the demand from cigarette manufacturers, which is a derived demand of cigarettes from consumers. This derived demand is taken to represent the retail demand for cigarettes, since the structure of demand at the retail level should be reflected in demand at the wholesale (cured leave level). The difference in the demand schedule should only be the marketing margin including processing costs (Tomek and Robinson 1981).

The demand for MFCV tobacco is specified as follows:

$QTCUR_t$ = f($PRCUR_t$, $GDP_t$)

where:

| | | |
|---|---|---|
| QTWR | = | quantity of cured tobacco leaves consumed divided by population in kg/person |
| PRCUR | = | price of cured tobacco leaves divided by the CPI in RM/kg |
| GDP | = | real GDP divided by population in RM1,000/person |

In the estimation, a dummy interactive variable was included in the equation for the variable GDP on the hypothesis that towards the end of 1980s consumers were more conscious towards health and that income may not be positively correlated with consumption. The dummy is equal to one after 1988 and zero otherwise. Estimation with OLS yielded the following results:

$$QTCUR_t = 1.27369 - 0.0266PRCUR - 0.00007GDP^{***}$$
$$\quad\quad (4.479) \quad (-1.447) \quad\quad (-3.128)$$
$$+ 0.0000091GDP*DUM$$
$$(0.903)$$

$R^2 = 0.56$; Adj.$R^2 = 0.48$; n = 22; F = 7.618***; D.W = 2.182

From the estimated equation income seems to be negatively correlated with consumption. This is acceptable for the consumption of tobacco. As health awareness, income and standard of living as well as quality of life increase, the consumption of tobacco will decrease. The own price variable has the expected sign, but is not significant. Its t-value, however, is more than 1.0.

With the estimated parameter on price, the elasticity of quantity of tobacco consumed with respect to price evaluated at the means is 0.65. This means that a 1% drop in prices will increase consumption by 0.65%. From the previous estimation, the drop in flue cured tobacco prices is expected to be 43.5%. Therefore, the increase in consumption of tobacco is expected to be 28.28%. Based on 1996 consumption of tobacco at 9.102 million kg, consumption will increase by 2.574 million kg. Consumer surplus is estimated to be more than RM58.88 million. Of course, this estimation is purely on the conventional welfare surplus. The costs of the secondary effects from increased tobacco consumption to society such as increase in health expenditure are not internalized into the welfare measurement in this analysis.

### 5.3.4 Effects on domestic supply

In theory, it is not possible to model a supply function with a production quota in place, since the forces of demand and supply cannot work freely due to the quota. However, Mohd Noor Mamat (1985) put forward several arguments that pointed to the reality that prices do play a role in influencing supply in the Malaysian tobacco industry. First, he argued that due to the variability in production due to weather and other factors, the actual response of quota to production is not known. Curers have been known to produce from 0% to more than 100% of their production quota. Thus, although the production quota tends to limit production, the NTB is quite flexible with this issue. Curers who are able to produce more than the allocated quota are allowed to do so after receiving approval from the NTB. Secondly, although prices are controlled by the NTB based on fixed prices for designated grades, there is no guarantee that the "right" price for the designated grades may be obtained. Supply and demand forces may come into play. At a time of high supply level, prices may be reduced by an understatement of grades, while grades can be overstated when supply is low or when demand is high. This argument can also be applicable when the farmer sells the fresh uncured leaves to the curers.

Based on the above argument and the acknowledgement that some forces of supply and demand are still at play despite the production quota, a supply function for tobacco at the farm level can still be estimated. Based on supply theory, the supply of uncured leaves is specified as follows:

$$SUPUNCUR_t = f(LPRUNCUR_{t-1}, QUOTA, YEAR)$$

where:

| | | |
|---|---|---|
| $SUPUNCUR_t$ | = | production uncured tobacco in million kg |
| LPRUNCUR | = | price of uncured tobacco lagged one year in RM/kg |
| QUOTA | = | production quota of cured tobacco in million kg |
| YEAR | = | year as a proxy for technology |

Estimation yielded the following results:

$$SUPUNCUR_t = \underset{(3.157)}{7226.0189} + \underset{(3.243)}{263.2311}LPRUNCUR_{t-1}^{***} \qquad \text{(Equation 4)}$$

$$+ \underset{(3.907)}{10.8777}QUOTA^{***} - \underset{(-3.171)}{3.7361}YEAR^{***}$$

$R^2 = 0.67$; Adj.$R^2 = 0.59$; $F = 8.043^{***}$; $n = 16$; $D.W = 1.72$

The above model appears to be satisfactory with high overall significance of the equation and an acceptable $R^2$. All variables are significant at the 1% level, while all signs except YEAR are in accordance with a priori expectations. The variable year, which is supposed to capture effects of technological changes, is expected to be positive. However, the variable may be capturing the effects of other development in the tobacco industry causing it to turn negative.

Based on the estimation, the supply elasticity of uncured leaf production with respect to the price calculated at the means is 1.97. This is a fairly high estimate for an agricultural product. However, this estimate is comparable to the supply elasticity of 1.92 obtained by Samsudin and Mohamad (1992). With an own-price elasticity of supply of 1.97, a 1% decrease in the price of uncured leaves will result in a 1.97% decrease in quantity produced. Taking into consideration that uncured tobacco prices are expected to decline by 37.16% with complete liberalization, production will decline by 73.21% or by 71.05 million kg based on 1996 production figures. Producer loss is estimated to be RM17.32 million.

## 5.4 The location-specific study

### 5.4.1 Description of the study area

The location chosen to study the locational effects of trade liberalization is a tobacco growing district called Bachok in the state of Kelantan, in the northeastern region of Peninsular Malaysia. This state is one of the poorest in the country. It had a population of about 1.2 million in 1991, while the district of Bachok had a population of about 100,000. About 60% of the production quota is allocated to this state to help the poor to be gainfully employed through tobacco cultivation. In 1997, the quota allocated to this state amounted to more than 7.8 million kg of cured tobacco. However, it only managed to produce 7.6 million kg or about 97% of the quota.

The district of Bachok alone was allocated a production quota of 2.874 million kg of cured tobacco in 1998, representing 20.3% of the total quota given. It is the largest tobacco growing area in the country. Crop area recorded in Bachok in 1997 was 2,032 hectares. In all aspects, both quantity and quality, this area is the most efficient and productive tobacco producing region in the country. In 1997, the average yield of cured tobacco in this district was 1,250 kg per hectare, about 20% higher than the national average yield.

Most farmers grow about 3,000 tobacco plants per season covering an area of about 0.42 acres or 0.175 hectares. The number of tobacco farmers registered in 1997 in Bachok totaled 4,396 farm families. Taking 1991 as the population base year and a population growth rate of 2.5% per annum, total population in Bachok today is estimated to be in the region of about 122,000 people or 30,500 families. Hence, about 15% of the total families in this district are involved in tobacco farming. The district also has 1,865 curing barns owned by 58 curers. In addition there are more than 5,000 workers employed at the curing stations. In short tobacco farming, curing and related tobacco activities form a major economic activity in this district.

### 5.4.2 Costs and returns of uncured leaf production

Table 5.3 exhibits the costs and returns from the production of one hectare of uncured fresh tobacco leaves. Net returns from one hectare of tobacco cultivation are estimated to be RM2,892 per hectare per season. Since most of the labor utilized is family labor, returns to labor are estimated at RM5,992 per hectare per season. However, the majority of the farmers in Bachok district operate a farm size of only 0.175 hectare. Proportionately, the family will receive a net income of about RM506 and returns to labor of RM1,048 per season.

**Table 5.3 Costs and returns per hectare of uncured tobacco in Bachok, Kelantan.**

| Item | | Cost/Returns (RM) | Liberalization Scenario |
|---|---|---|---|
| Costs | | | |
| Sowing and potting | | | |
| i. Seeds, chemicals and fertilizers | | 37 | 37 |
| ii. Plastic cover, seedbed frame and potting bags | | 173 | 173 |
| Growing stage | | | |
| iii. Land rental | | 870 | 870 |
| iv. Fertilizer and chemicals | | 466 | 466 |
| v. Ploughing and tilling | | 429 | 429 |
| Equipment depreciation and maintenance cost | | 691 | 691 |
| Labor | | 3,100 | 3,100 |
| Total costs | | 5,776 | 5,776 |
| Returns<br>11,000 kg @ RM0.788/kg | Returns under liberalization scenario:<br>11,000 kg @ 0.495 | 8,668 | 5,445 |
| Net Returns | | 2,892 | (-331) |

Source: Adapted from Tobacco Statistics, National Tobacco Board, 1998.

### 5.4.3 Impacts of liberalization

Under a scenario of complete liberalization of the tobacco industry, the price of uncured tobacco is expected to decline by 37.16%. Based on the 1997 average price of RM0.788 per kg uncured leaves received by farmers in Bachok, the price would decline to RM0.495 per kg. At this price level, net income per hectare would be - RM331 (Table 5.3). However, returns to labor are still positive at RM2,769 per hectare.

For the average farmer operating a farm size of 0.175 hectares, gross income will be reduced to RM952 from the pre-liberalization scenario of RM1,516. Net returns however would decline to - RM57.93 and returns to labor to RM484.57 from RM1,048 previously. Net income is expected to decline by almost 111% while returns to labor are expected to decline by almost 54%.

## 5.5 Policy implications and recommendations

### 5.5.1 Overall assessment

From the analysis of welfare gains from the consumers' and producers' perspectives, the net gain in welfare was calculated to be RM43.29 million. However, the government will incur losses in revenue collection that came in the form of import taxes on tobacco. In 1996, revenues from tobacco tariffs alone were estimated at more than RM500 million. Furthermore, under the liberalized scenario, imports will increase due to the decline in supply and increase in demand. This study estimated that imports would increase by about 12,760 tons. Based on the price of filler tobacco at about RM6.00 per kg, the additional import costs that have to be borne by the government would be more than RM76 million.

At the farm level, most tobacco farmers will lose a substantial portion of their income. Each farm family in tobacco farming will experience a loss of income of more than RM560 per season in terms of returns to labor. Considering that there are about 23,000 farmers nation-wide involved in tobacco farming, total loss to the tobacco farming community would be about RM12.9 million. If other workers in the industry are taken into consideration the loss of income would be considerably higher. This loss in income would pose the government a serious socio-economic issue, since most of the small farmers involved in tobacco farming belong to the rural poor. Malaysia, no doubt, will be in a serious dilemma weighing the advantages and disadvantages of liberalizing the tobacco industry. Apart from the economic, socio-economic and political implications, the issue of the morality of producing a product that can be hazardous to the health of society is also currently being seriously debated.

### 5.5.2 Recommendations

Considering the above analyses, the government can take the following steps in facing the challenges facing the Malaysian tobacco industry resulting from liberalization initiatives:

- Implementing a gradual structural adjustment program in the tobacco industry: From a purely economic and social perspective, it is not in the best interest of the country to liberalize the tobacco trade. The negative impacts of liberalization are too substantial to be offset by any meaningful gains. However, Malaysia is committed to trade liberalization in tobacco. Although, the UR Agreement would not have any significant impacts on the industry, the impacts of the CEPT-AFTA of ASEAN, whereby all agricultural products (except the highly sensitive products) will have an ending tariff of between 0% - 5%) will have serious consequences on the industry. Malaysia has a time frame of about 10 years to liberalize under AFTA. It can start to slowly dismantle its tobacco tariff to ASEAN in stages so that the process of adjustments can begin now.
- Restructuring production: The tobacco industry in its present form is certainly non-viable. The curer system whereby uncured and cured tobacco production processes are separated and under different producer groups has led to high inefficiencies in the industry. This system needs to be phased out and replaced with the grower-curer system or a system that will allow increased economy of scale and lower costs of production. Data from NTB indicated that the average costs of cured tobacco under the grower-curer system range between RM6.85 and RM7.38 per kg, while that of the curer system averaged RM11.41. The grower-curer system managed to cut cost of production by almost 38%. With average costs in the region of RM6.50, Malaysia would be in better position to compete with Thailand, where costs of production were reported to be in the region of RM4.50/kg.
- Implementing an income support program: A de-coupled income support program would facilitate farmers to gradually acquire new know-now and venture into other economic activities. This direct income support would only be given for a specified number of years, giving sufficient time for the farmers to adjust to changing economic conditions and opportunities.
- Other facilitating programs: Other programs that will assist the industry include improving infrastructure in selected areas, focusing institutional support on adjustment

programs, supporting R&D on alternative crops and increasing productivity of tobacco under alternative production systems.

# 6. Summary and Conclusions

This study on the effects of liberalization on palm oil, rice and tobacco crops in Malaysia confirms the fact that local industries that are competitive will gain while inefficient domestic industries will lose from liberalization. Palm oil in Malaysia, reputed to be the most efficient in the world, will benefit in all aspects including increased exports, higher earnings to the industry and better competitive footing in the international market, as other edible oil producers need to scale down support to their respective industries. Uncompetitive industries in the Malaysian case, such as rice and tobacco, will lose. These industries are expected to be 'naturally' downsized as the effects of liberalization work their way through the economy. Eventually, there will be all-round efficiency gains to the economy as resources are re-allocated to the more productive sectors of the economy.

Nevertheless, evaluation of gains from a purely economic sense can be misleading as nations also have objectives other than economic and pure wealth creation for society. Evaluation from income and equity distribution aspects to all levels of society also needs to be seriously viewed. In agricultural enterprises, the use of policy instruments to protect agriculture is mainly to protect and enhance income of the rural poor. There will be painful adjustments for the affected farming population resulting from liberalization.

In facing the challenges and opportunities in agricultural trade liberalization, the market-based approach has to be adopted in further developing the industries. Society-based strategies may no longer be applicable in this globalization era. Strategies and programs to develop specific enterprises may now need to be differentiated from social programs like helping the poor. Competitiveness is not the same as welfare.

One market-based strategy that developing countries like Malaysia needs to adopt would be to strengthen the five pillars of economic foundation, i.e. infrastructure, finance and capital institutional support, R&D and technology as well as human resource development. Strengthening the economic foundation in a particular sector would enable the sector to be more efficient. Previous allocation that used to support subsidies should now be re-allocated towards strengthening these foundations.

In summary the following recommendations that are globally applicable to all sectors can be considered:

- strengthen the economic foundation to increase efficiency of agricultural industries;
- prepare for adjustments in the affected sectors including planning for income support programs;
- widen product range and value-added to increase product competitiveness and industry profits;
- enhance marketing efforts for market diversification and deepening;
- re-structure production to allow farm consolidation and operation of better economy of scale, and
- increase rural industrialization to create better employment and income generating activities from competitive industries.

In conclusion, it can be said that economics tells us that there are gains to be made from free trade. However, the true outcome of the liberalization measures evaluated from all aspects that are important to society, especially in developing countries, is too early to know. Only the passage of time will tell.

# 7. References


Abdul Aziz, A. R. 1999. The Asian crisis, reform measures and agricultural response: Malaysia. Paper read at the Policy Workshop on Asian Crisis, Reform Measures and Agricultural Response, Manila, January.

Ahmad Zubaidi. 1990 A Model for the Rice and Wheat Economy in Malaysia. Occasional Paper, Pusat Kajian Dasar Pertanian, Universiti Pertanian Malaysia.

Alias, N.S.; Nik Mohd Nor; and Abdullah, A. 1990. Toward meeting regional technology requirements for MADA. *In* Special Report on Rice Industry in Malaysia. Malaysia Agricultural Research and Development Institute MARDI, Serdang (mimeograph).

Ariffin, T. 1996. Review of Minimum Paddy Price. Economic and Technology Management Research Centre, MARDI, Serdang (mimeograph).

Ariffin, T. 1998. Kegawatan ekonomi dan pengeluaran beras negara: satu penilaian semula Agromedia 4:5-9.

Armodee, V. 1969 Can West Malaysia become self-sufficient in rice by 1975? Malaysian Econ. Rev. 16:79-87

Brando, A.A.P.; and Martin, W. 1993. Implications of agricultural trade liberalization for developing countries. Agricultural Economics, 8:313-43.

Chamhuri, Siwar. 1985. Persistent poverty among padi farmers: impact and implication of the padi subsidy scheme. Paper read at the seminar on Problem and Prospects of Rural Malaysia, Kuala Lumpur.

Department of Agriculture. Paddy Statistics of Malaysia. Department of Agriculture, Kuala Lumpur: various issues.

Department of Statistics, Malaysia. External Trade Statistics, Kuala Lumpur: various issues.

Economic Planning Unit (EPU), Prime Minister's Department. 1999. Mid -Term Review of the Seventh Malaysia Plan 1996 – 2000, Kuala Lumpur, April.

Economic Planning Unit, Prime Minister's Department, Malaysia. Malaysia Five Years Plans, Kuala Lumpur, Malaysia: various issues.

Fatimah, M.A.; and Mohd Ghazali, M. 1990. Market Intervention in Padi and Rice Industry: Evolution, Rational and Impact. Occasional Paper No. 6, Centre for Agricultural Policy Study, Universiti Pertanian Malaysia, Serdang, Selangor.

Fatimah, M.A.; and Mohd Ghazali, M. 1983. Kesan Skim Subsidi ke atas Petani Padi di Malaysia. Universiti Pertanian Malaysia, Serdang, Selangor (mimeograph).

Federal Agricultural Marketing Authority (FAMA). 1994. Household Consumption Survey, Kuala Lumpur, Malaysia.

GATT. 1994 . Increases in Market Access Resulting from the Uruguay Round, Geneva.

Goldin, I.; Kundsen, O.; and van der Mensbrugghe, D. 1993. Trade Liberalization: Global Economic Implications, OECD, Paris.

Goldman, R. 1975. Staple Food Self-sufficiency and the Distribution Impact of Malaysian Rice policy. Food Research Institute.

Jailani, Sukaimi; and Malek, Mansoor. 1995. Support policies for the Malaysian oil palm industry. Paper read at the FEDEPALMA International Conference, Barranquilla, Colombia, June.

Jegathesan, S. 1996a. Farm-level profitability of paddy production - some findings from the Muda scheme. *In* Recent Advances in Malaysia Rice Production - MADA/JIRCAS Integrated Study Report. ed: Y. Morooka, S. Jegathesan and K. Yasunobu

Jegathesan, S. 1996b. Rice production in Malaysia. *In* Recent Advances in Malaysia Rice Production - MADA/JIRCAS Integrated Study Report. ed: Y. Morooka, S. Jegathesan and K. Yasunobu

Kean, L.L; and Meng, C.C. 1996. Irrigation development and management of the muda irrigation scheme. *In* Recent Advances in Malaysia Rice Production - MADA/JIRCAS Integrated Study Report. ed: Y. Morooka, S. Jegathesan and K. Yasunobu

Mad Nasir, S.; Fatimah, M. A.; and Fauziah, A. H. 1997 . The effect of export duty liberalization on the Malaysian palm oil industry. Paper read at the 22nd. World Congress and Exhibition of the International Society for Fat Research (ISF). Kuala Lumpur, September.

Mad Nasir, S.; Fatimah, M. A.; Zainal Abidin, M,; and Abdul Rahman, L. 1994. A market model for Malaysian palm oil industry. The Malaysian Journal of Agricultural Economics 11:81–102.

Maddala, G.S. 1977. Econometrics. New York: McGraw Hill.

Ministry of Agriculture, Malaysia. 1992. The National Agricultural Policy (1992-2010). Kuala Lumpur.

Ministry of Agriculture, Malaysia. 1997. Review of the National Agricultural Policy (1996-2010). Kuala Lumpur.

Ministry of Agriculture, Malaysia. 1999. Third National Agricultural Policy (1998 – 2010). Kuala Lumpur.

Mohamed Ariff; Mahani, Z.A; and Tan, E.C. 1996. Study of the Emerging Global Trading Environment and Developing Asia: The Malaysian Perspective, Asian Development Bank.

Mohammed, Y.; and Mohamad, S. 1987. The elasticities of supply and demand for Malaysian primary commodity exports. Malaysian Journal of Agricultural Economics 4:59–72.

Mohd Noor Mamat.1985. The Firm Level Supply Response of Flue-Cured Virginia Tobacco in Malaysia. Unpublished Master of Science Thesis, Southern Illinois University.

Mohd. Ibrahim; and Wong, Larry C.Y. 1998. Rice supply chain management in Malaysia in turbulent times: challenges and responses. Paper read at the Word Annual Asia International Rice Conference, Phuket, Thailand 29-30 Oct.

Muda Agricultural Development Authority (MADA). 1996. Annual Report, Ministry of Agriculture, Alor Setar: various issues.

National Tobacco Board. Tobacco Statistics 1997. National Tobacco Board, Ministry of Primary Industries, Kota Bharu: various issues

Nik Fuad, N. M.K. 1993. Government Policy Impacts On the Malaysian Rice Sector. Makalah Sesekala, Malaysian Agricultural Research and Development Institute, Serdang, Selangor.

Nik Fuad, N. M.K. 1990. The Malaysian Agricultural Sector: Performance, Prospects and Opportunities. Techno-Economic and Social Studies Division, MARDI, Serdang, Selangor (mimeograph).

Palm Oil Registration and Licensing Authority (PORLA). PORLA Palm Oil Statistics, PORLA, Ministry of Primary Industries, Kuala Lumpur: various issues

Poapongsakorn, N; and Ungphakorn, P.M. 1995. Implications for Thai agriculture: computable general equuilibrium (CGE) calculations and beyond. *In* Benefits and Challenges Facing Asia-Pacific Agricultural Trading Countires in Post-Uruguay Round Period: ESCAP Studies in Trade and Investment Series No.11, United Nations, New York.

Samion Abdullah; and Tengku Ariff, T.A. 1990. Present situation and future propects of trade liberalization of agricultural products in Malaysia. Paper read at the International Seminar on the Liberalization of the Trade in Agricultural Products and the Protection of Farmers Interests, Seoul Korea, June.

Samsuddin, Md. Jani; and Mohamad, Y. 1992. The effects of trade liberalization on Malaysia's tobacco production and trade. Paper read at the National Conference on Economic Globalization: Issues, Challenges and Response by Developing Economies, Langkawi, August.

Tan, S.H. 1987. Malaysia's Rice Policy: A Critical Analysis. ISIS Issue Paper. Institute of Strategic and International Studies (ISIS) Malaysia, Kuala Lumpur.

Tengku Mohd Ariff Tengku Ahmad. 1998. Effects of Trade Liberalization on Agriculture in Malaysia: Institutional and Structural Aspects. Working Paper Series No. 34, CGPRT Centre, Bogor.

Titapiwatanakun, B. 1994. Study on The effect of ASEAN free trade area (AFTA) on the production, consumption and trade of palm oil in Thailand. A Report Prepared for the Regional Office for Asia and the Pacific Food and Agriculture Organization of the United Nations.

Tomek, W. G.; and Robinson, K.L. 1981. Agriculture Product Prices. 2$^{nd.}$ Ed. Ithaca, New York, Cornell Universoty Press.

World Bank. 1984. World Bank Sector Report: Malaysia Incentive Policies in Agriculture. Country Programs Department, East Asia and Pacific Regional Office.

World Bank. 1988. Sector Report: Malaysia Review of the Rice Industry. Agriculture Operations Division, Country Development, Asia Region.

Zaleha, M.N.; and Mohd. Ariff; H. 1986. The impact of free fertilizer subsidy scheme on economic efficiency of paddy farmers in West Malaysia. Malaysian Journal of Agricultural Economics 3:12-29.

# Erratum

## Working paper 46
## Effects of Trade Liberalization on Agriculture in Malaysia:

### Executive Summary
### Paragraph 2 page xx

The paddy sub-sector is one of the most highly protected agricultural sub-sectors in Malaysia with a high degree of market intervention. This protection is accorded based on food security and socio-economic reasons, the paddy sub-sector being the sub-sector with one of the highest incidence of poverty in the country. Liberalization is expected to bring about rationalization to the industry. Analyses from this study indicated that liberalization of the paddy and rice industry would, as expected, decrease domestic supply while increasing demand. There are all round efficiency and welfare gains that will benefit Malaysia, mainly brought about by the increase in consumer surplus and a decrease in government spending on subsidies. The total gain in consumer surplus brought about by the liberalization is RM286.2 million while the loss in producer welfare is estimated to be RM200.1 million. Hence, net welfare gain is estimated to be RM 86.1 million. However, there is a reduction in government expenditure to support the paddy rice subsidy program, which is equivalent to RM553 million. Also, imports will increase quite significantly to cater for the increased demand-supply gap and farm incomes would be reduced by about 15%. Supply is predicted to decrease marginally by 1.34%.

### 4. Paddy
### 4.5 Commodity-related effects of liberalization

#### 4.5.6 Welfare effects page 43

*Loss in producer surplus*

The producer surplus is also calculated on the same basis as the consumer surplus. It measures the sum of the difference in values of the new level of production and the value of rice not produced due to a decline in farm price by RM140 per ton. The new rice production level at 1,419,514 or 2,183,868 tons of paddy (based on 1996 production) takes into consideration the decrease in rice production of 19,280 tons or 29,662 tons of paddy. The value of the new level of production is RM198.73 million, and the value of rice not produced is RM1.35 million. Hence, the total loss in producer surplus is RM200.08 million.